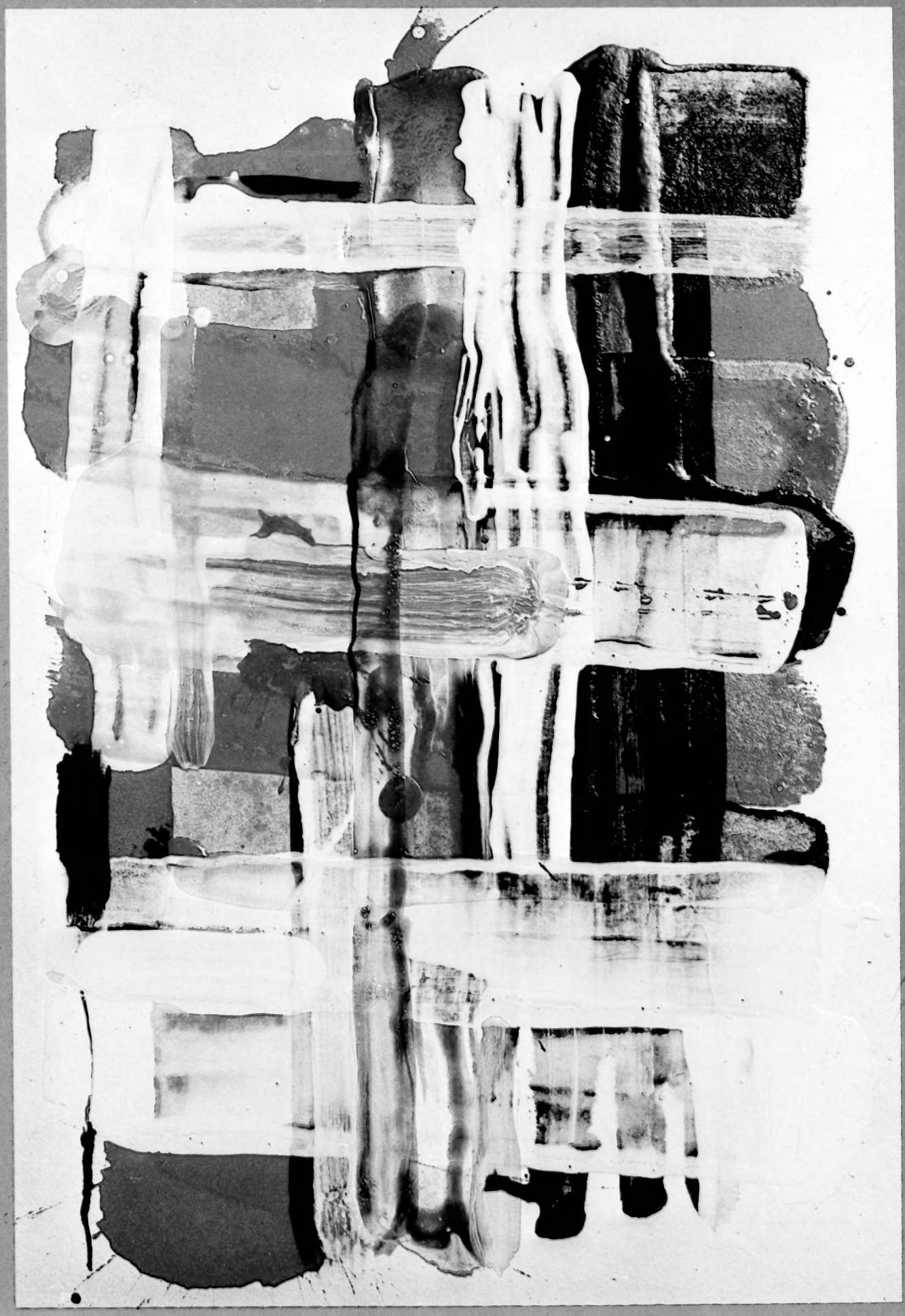
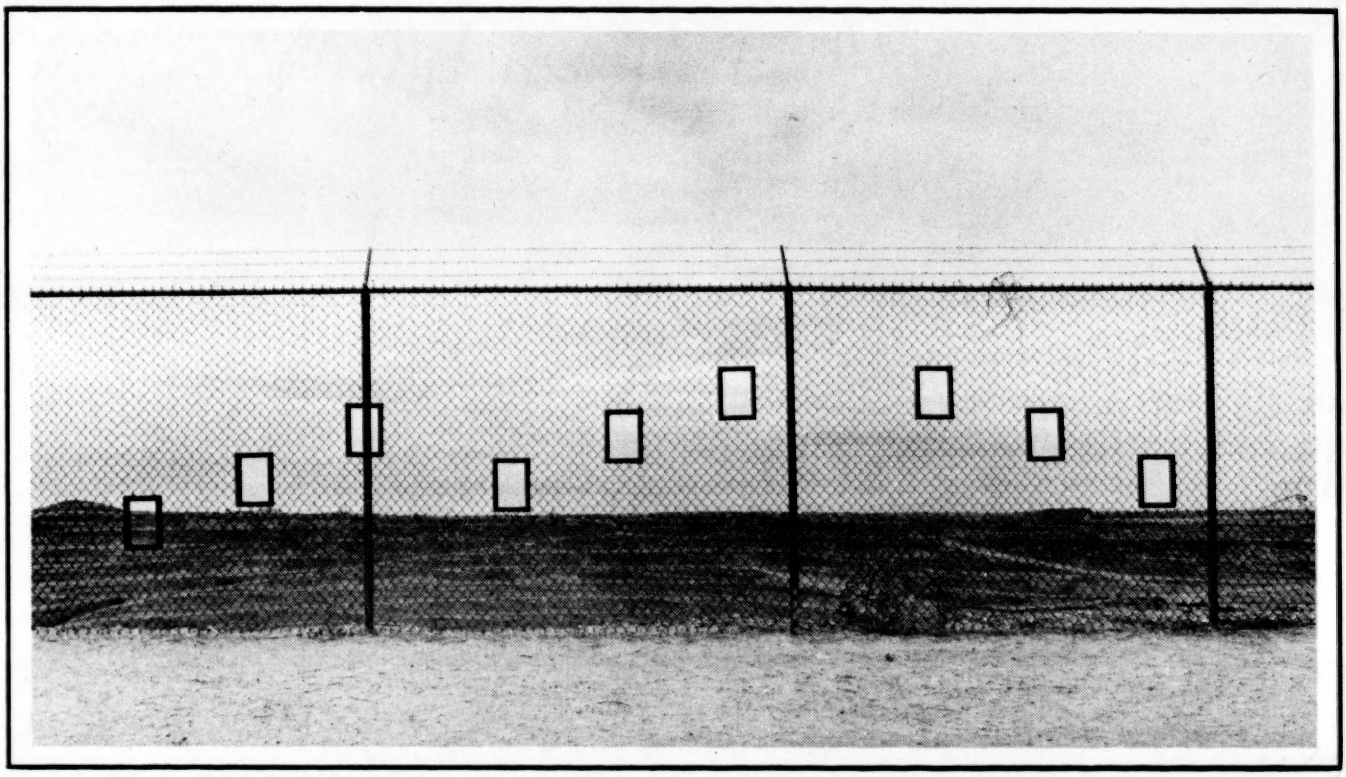
The CoEVOLUTION Quarterly



$2 Spring 1975

Photograph of bee returning to hive loaded with pollen. From a wonderful book, **Insects in Flight,** *reviewed in this issue.*



Larry Keenan, Jr.

**"Learn to distinguish
between unity and uniformity –
between God and hell."**

– E. F. Schumacher, 1974

Cover artist

DEAN FLEMING, 42, was one of the founders of Libre Commune in southern Colorado. I first met him then, 1968, when I was selling books from the back of The Whole Earth Truck Store. A year later Dean had the most impressive dome on the land and had decorated the mountainside. As you walked by below his dome – a thoroughfare – images converged and diverged up in the trees. A cloud made lightning and a sun came out from behind it. Four apparently random red sticks came together to make a perfect frame at one point, then dispersed again.

Dean was a San Francisco artist from 1956 to 61, a New York one from 1962 to 67 (a founding member of the Park Place Gallery). 1972-74 he was at the Ticalqui art community in Ecuador. His most recent paintings are shown at the Max Hutchinson Gallery, New York.

Dean is who I think of when I hear the word "gentleman". Hard with himself, easy on others.

– SB

Apocalypse Juggernaut, hello.

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Apocalypse Juggernaut, hello.

Well-Founded Rumors

Prediction

Is fiction.

That's easy to forget when you're doing it, or reading it with belief. It's impossible to forget when the predictions are old — of all utterances they are the most perishable.

Some are less perishable than others, however, and since the whole process is so crucial to adaptive life, it might be worth figuring out some sorting principles — how to recognize good forecasting in time to use it. I suppose most of such evaluation always has to be experience and inarticulate intuition. But some might be statable principles, such as follow. Please join the conversation if you've got something.

Self Projection

We can usually grasp a question most productively by its pathology, and the pathology of prediction, I suspect, is control. The attempt to control the future by naming it: one's desires or fears projected on the future, with numbers. "Unemployment will drop in 1975 to less than 5%, interest rates will continue down, and the Dow Jones will reach 900 (and I'll be elected again)." "You're all going to die, die, die, and the price of gold (my gold) will be $400/oz."

No predictor is disinterested in the future, but the good ones know their interests and are able to set them aside. An example of one who does is Dale Jorgenson, the econometrician who limned 1975 in the Winter **CQ** *— more of him in a moment. An example of one who revels in interests is me — who craves economic collapse and dreads biological collapse. An example of one who oscillates between desire and fear is Robert Heilbroner, author of* **The Great Ascent** *(1963) and* **An Inquiry into the Human Prospect** *(1974 — "The Greater Fall" he might have called it).*

We are all predictors. We are all pushing our best attempts at self-fulfilling prophecy. For a case of this reasonable behavior gone very bad, consult the late-February 1975 **Business Week** *article on the US Government's Council of Economic Advisors. Up till 1968 the Council's "objective forecasting" was sincere, randomly correct, medium grade prediction. Since 1968 it has responded to political pressure with non-randomly wrong (optimistic) appraisal favorable to the existing policy-makers.*

In other words, whatever the Government tells you is happening you can count on to be wrong — probably opposite to what they perceive as the truth. "Once the system starts lying it can never tell the truth again?" I asked Dale Jorgenson. "That's right," his telephone voice said, "because then they have to explain the lies with other lies. The only way you can terminate a process like that is get another group in there."

The same thing can happen in your head.

Story

It is fair to demand of a prediction that it be good fiction — that it ring true (wring true) whether or not it happens.

This is where predictors awash in their own fears and desires have the advantage. Their story gains a unity from their committed point of view. Their belief inspires your belief. For a wonderful example of this try the apocalyptic final chapters of Doris Lessing's **Four-Gated City** *(1969, CATALOG p. 409). Or almost any Buckminster Fuller — there's some immediately following on p. 8.*

The "objective" predictor must manage without a unifying personal identification. Usually his best substitute is a model, a set of theories living out a love-hate relationship with the data, hopefully adapting progressively to them.

Dale Jorgenson: "The guys who do the best forecasting are the people who are really on top of current events. It doesn't take any great computer to absorb all this information — there's just not that much of it. People who read the financial press assiduously and watch the statistics, generally tend to be better — whether or not they're aided by a model.

"The only thing that a model contributes is — as you said about writing good fiction — to keep the story straight and not have one character going off in one direction in one chapter and then coming back in a somewhat different direction in another. With a model you can take a given set of facts and produce many many other facts that are implied or consistent.

"The best forecasters are not necessarily model-people. The good ones are very good historians. A lot of that is on an intuitive level. Because predicting is not a scientific discipline, fraud is always possible, lapses in personal integrity are always possible, and the problem is how to control it. In an experimental situation you repeat the experiment. With forecasting how do you repeat . . .?"

I asked Jorgenson if the routine failure of economic models was due to poor models or poor data. "I would say both. The data base is very limited in precisely the areas that are important now, namely 'real factors' — such as the input-output flow of goods and services, or how much oil and gas really is in the ground. For agriculture we have better information. And the data base is very good for things like what the effect of government policy is going to be in an aggregative sense — what we've been engaged in since 1946 — that's Keynesian economics."

Whose fictional qualities got out of hand. An author, however fine, must respond to the universe, not try to manufacture it.

[more →]

THINGS FULFILLED

Tortured by fear and suspicion,
mind agitated, eyes alarmed,
we invent ways out,
plan how to avoid
the inevitable danger that threatens us so terribly.
And yet we're mistaken, there's a different danger ahead:
the news was wrong
(or we didn't hear it, or didn't get it right).
Another disaster, one we never imagined,
suddenly, violently, overwhelms us,
and finding us unprepared – there's no time now –
sweeps us away.

*– C.P. Cavafy**

*From C. P. Cavafy — Selected Poems, translated (from Greek) by Edmund Keeley and Philip Sherrard, 1972, Princeton University Press. Sent by Richard Baker.

The Substrate

I propose that the best gauge of a predictor's quality is the extent of his or her field experience in the substrate — immersed in the actual flow of materials, energy, food, agriculture, weapons, money, population.

For a bad example take a gent I enjoy, Herman Kahn. His 1967 book **The Year 2000** *(CATALOG p. 22) projected from ideas and from fashion and took no account of population, environment, or energy. It was useless by 1970.*

By contrast consider E. F. Schumacher. Son of a German economist, he taught at Bonn, Oxford, and Columbia. To deepen his economic experience he then spent time as an English farm laborer at £2 a week, became an economic journalist, and after World War II worked on Germany's reconstruction. In 1950 he was appointed economic advisor to the British National Coal Board and remained there for 20 years. The first ten years was spent assessing what they had. On April 10, 1958, he presented a paper at a nuclear energy conference, with this passage (quoted in the 12 Sep 74 **New Scientist***):*

> The forecasts . . . of Western European fuel consumption during the next few decades point to an ever-growing gap between requirements and indigenous supplies — a gap which could be closed only by oil imported mainly from the Middle East. Quite apart from the balance of payments problems created thereby, a development of this kind, I suggest, would mean the end of Western European independence. The whole Western European economy would become so vitally dependent on Middle East oil that anyone in a position to withhold or even to disturb these supplies would be Europe's master. If present plans are carried through, the position will be irretrievable within 20 years from now. Western Europe will then have attained a position of maximum dependence on the oil of the Middle East precisely at the moment when the first signs of a world famine become visible. The political implications of such a situation are too obvious to require discussion.

I know of no one else who called that particular shot. 1973, the Energy Crisis, is known as the year when all the forecasters went off the rails.

Other reliables? Paul Ehrlich, who is first and foremost a population-biologist fieldworker, has not had to apologize for **The Population Bomb** *(1968, CATALOG p. 34). The Paddock brothers, steeped in Third World food supply problems, wrote* **Famine 1975** *in 1968. Who else would you add?*

CQ Track Record

And how about us? You can't repeat forecast situations, but you can see if the ones that were made, turned out. You can read your horoscope at the end of the day instead of the beginning. Here's last year's **CQ** *predictions:*

January 1974, preliminary EPILOG in **Harper's.** *We quoted the Burpee Company that* **seeds** *would be short. I never heard that they were. Jim Harding said that* **water** *would become critical in the US, stretched between agriculture, mining, and power generation. Not much on that yet. Howard Odum said that* **nuclear power** *was not yielding net energy. That one is now acknowledged. He also called the* **Oil Shale Bubble** *correctly, same reason.*

March 1974, first **CoEvolution Quarterly.** *James Gavin accurately forecast* **sugar** *problems about four months before anyone else. We said it would be not just expensive but short. It was expensive but not short. Gavin also correctly forecast big* **spending by Government** *to slow down the recession. We summarized Reid Bryson's analysis of* **climate,** *which predicts monsoon failure for the rest of the century. The 1974 monsoon was spotty but there; 1975's won't be checkable till summer. I used the phrase "likely* **food shortages** *by next winter". They did not occur. That issue also reprinted* **Not Man Apart's** *discussion of* **phosphate** *fertilizer as a critical nonrenewable resource. More on that below.*

June 1974, Summer **CoEvolution Quarterly.** *"India's* **food crisis** *is coming fast," I wrote. A month later all the press was talking about famine, and all of us were a bit off. India got more foreign aid than expected, including a boost from Iran, and she had more money to divert to food purchase than expected — though if that's diverted from fertilizer and spare parts, only time has been bought.*

I repeated the **Atlanta Journal's** *report that* **canned food** *would be up 25% by Fall. It wasn't. The world-wide* **food catastrophe** *I predicted "during the next several years" has yet to occur. Just now there's something like a world wheat surplus. As for* **drought** *in the US high plains, reader Donald L. Reynolds reported from Amarillo, "Your well-founded rumor seems to be rooted in caliche, nature's cement on the high plains . . . Drouth (Texas spelling) is in the air as surely as the stench of bovine anthrax victims." I also predicted international* **epidemics.** *None yet.*

In that issue we mentioned that **gold** *bullion would become legally ownable by Americans and that the price might go to $200/oz. It was then $159. A few months later gold was a big media flash, and just before legalization at New Year's the price reached $196/oz. There was no gold rush however; the price now is $181.75. What we should have recommended was the purchase of gold coins, which were legal then, and are still a better deal than bullion.*

December 1974, Winter **CoEvolution Quarterly.** *Despite our best efforts the* **economy** *still has not collapsed. Nor has the* **United Nations.** *As for* **phosphates,** *however, we repeated* **New Scientist's** *Nov 74 prediction of a Morocco-based Arab phosphate cartel, which could control 70% of the world market of this vital agricultural resource.* **The Wall St. Journal,** *26 Dec 74, reported that Morocco raised its phosphate prices a further 8% and*

> . . . has recently joined, with the smaller phosphate producer states of Senegal, Algeria, Tunisia and Togo, in establishing an OPEC-like group, the World Institute of Phosphates. However, a Moroccan official says it isn't a cartel but an organization whose purpose is "to promote the use of phosphatic fertilizer."

The interview with Dale Jorgenson in the Winter issue helped our record enormously. As he predicted, **interest rates** *went down,* **inflation** *has leveled a bit (temporarily),* **unemployment** *has reached 8%, and the* **recession** *has continued worse than*

generally expected. He also said that **oil prices** *would be down toward the "monopoly optimum" of $7/barrel by Christmas; they're coming down more slowly than that.*

Jorgenson advised that it was a good time to get into the **Stock Market.** *Four months later he can say, "At that time the Dow Jones was at about 580, and is now of course over 700. Anybody who took their copy of* **The CoEvolution Quarterly** *into Merrill Lynch and said BUY! . . . has gone up about 20%."*

A footnote on Jorgenson's interest in the increasing economic effect of **do-it-yourselfers,** *"There was a story just the other day in* **The New York Times** *about the fact that home improvement materials have been booming. All the neighborhood hardware stores are hardly able to keep up with the demand for paint, nails, and small tools."*

The Fat

What throws off everyone's apocalyptic predictions is the fat in our system. Just like the plump girls at our week-long Hunger Show fast a few years ago (CATALOG p. 35) — they got prettier and happier every day, while the rest of us got sick and crazy.

So far as I've heard, no one is measuring the fat in the system or even knows where it is. Lewis Mumford (Winter 74 **CQ** *p. 18) says that it no longer exists in the back country — there's no hidden rural margin that can ignore the fall of civilizations. But there is new fat, I claim, in the proliferation of equipment.*

I told Jorgenson, "They could stop making tools today, and you could go on for ten or fifteen years on the tools that exist." He said, "That's the classic case of Castro Cuba. It's true that they didn't import any more cars after the embargo of whenever it was, 1958-59. But they still have the same stock of cars that they did. They just have a few more efficient mechanics. They've managed to cannibalize those things and keep them going."

India has more fat than we thought — or is that muscle they're now digesting?

There's fat in old habits that work, and something like fat in the ability to adapt quickly. There's fat in a system which feeds grain to livestock and burns oil rather than harvest solar energy. There's fat in good soil — if you have it — and fat in wilderness. There's no fat in monocrop and monoculture.

Maybe "fat" is just my word for ignorance.

— SB, 3 March 75

Gold in hell

. . . about the miner who died and went to heaven where he was met at the gate by Peter who inquired of him what he had done in life. The miner replied that he had been a gold miner. Peter told him that there was a surplus of gold miners and he couldn't come in. The miner asked whether or not he might be allowed to stay if he could get rid of all the other miners, to which Peter agreed to let him in for a trial run. Once in, the miner wandered around until he came across a couple of familiar faces. He walked over to them and whispered that there was a gold strike in hell. They shrugged their shoulders and continued on with what they were doing. Instantly the rumor was all over the place and people were leaving in droves. Within seconds it had emptied. A while later the miner, feeling lonely and isolated, went over to Peter to ask for permission to leave because, he explained, even though I was the one that started the rumor, there just might be something to it . . .

— Dick Donovan
Stamford, Connecticut

Notes

Firewood. *"The real energy crisis in the world," says Eric Eckholm at The World Watch Institute in Washington, "is not oil or nuclear power but the age-old question of firewood. More than half of all the trees cut down in the world today are cut down for firewood — still. This has really horrible consequences in a lot of countries. They're running out. In the case of India or parts of Peru there's no chance of using animal manure as fertilizer because it has to be used as cooking fuel, because there aren't many trees left. You could substitute kerosene, but if all the gasoline is used to drive Cadillacs in the United States . . ."*

Natural gas, *according to reports in* **Science** *(10 Jan 75) and* **Wall St. Journal** *(Feb 75), is on the wane in the U.S. Philip Abelson in* **Science** *says that natural gas "heats 55% of the nation's homes, is widely used as a feedstock for petrochemicals, including fertilizer, and is by far the largest source of energy for industry . . . . The rate of decay of supplies is such that by 1980, with a few exceptions, industry will be prevented from using natural gas. This would have enormous effects on the economy."*

Administration policy on solar energy *became clear at a recent Presidential breakfast. Someone asked Secretary of the Interior Rogers Morton about solar prospects. He replied, "Here's a flashlight. Be my guest, go heat your house." So says our reliable source.*

Anchovies are booming everywhere, *despite environmentalist hand-wringing a couple years ago, says fisherman Bob Haar of Ocean Park, Washington, "so look for more soybeans and lowered beef prices." The major use of anchovies is cattle feed.*

Rumor from the Mid East, *not particularly well-founded, is that the reason for India's atomic bomb is so that Syria can match the bomb which everyone assumes that Israel has. India gets favored relations from Syria in exchange.*

Arms control, *according to a reliable source, "is being taken over by the same people who gave us the Balance of Terror ten years ago". The same grim joy; new subject, Mid East invasion.* **CQ** *editorial request: don't invade. Not anybody for any reason.*

Three corrections *to Winter* **CQ.** *1) Mike Phillips based his remarks about the safety of cities during social upheaval on the Chinese Revolution and post-war Germany as well as the Russian Revolution. 2) With Gary Snyder's poems on p. 17, we should have indicated copyright © 1974 Gary Snyder. 3) What William James actually said on nitrous oxide was, "There are no differences but differences of degree between different degrees of difference and no difference." Zeno lives.*

2025, If...

BY R. BUCKMINSTER FULLER

Well, I see that Buckminster Fuller was granted Patent No. 3,863,455 this February for his floatable breakwater scheme. And this month — March — his reply to a question from the **Philadelphia Daily News** *appears in that paper and also here below. Later this spring his mathematical opus* **Synergetics** *will be published by MacMillan. Meanwhile his World Game players are also publishing (see p. 14). In 1970 he patented a different kind of rowboat called a Rowing Needle. Instead of a rocking chair.*

— SB

You ask, "where will the world be in 2025?" Some times people use the word "World" to mean the whole universe, "the most beautiful girl in all the World," sometimes much more limitedly as "in the sports world" but I take it that you mean the planet Earth together with all the human beings gravitationally cohered to it around its 200 million square miles of surface. If that is your definition of the world, then I reply, The world will as yet be orbiting around the Sun as the Sun and its planets merry-go-round with the Galactic System. Whether the unique chemical constituents of humans will as yet be anthropomorphically organized and as yet healthily serving the weightless mysterious phenomenon life on board Spaceship Earth is the touch-and-go, yes-and-no question. Whether or not humans will be alive on our planet will however probably be resolved by cosmic evolution as early as 1985. We don't have to wait until 2025 to find out. Human beings, unlike any other known phenomena, have been given minds with which to discover abstract, weightless principles operating in Universe and employ those principles in apprehending and treating discretely with the exclusively mathematical information regarding celestial chemistry and physics occurring in stars tens of billions of light years away from the little planet Earth. In contradistinction to human minds' unique capability, of discovering generalized and only mathematically stateable complexedly covarying interrelationships existing between and not in any of the geometrical, chemical or physical characteristics of any of the separate parts of complex systems, human brains as well as the brains of other creatures deal only with the unique sensorial inputs of each special case experience; the special color, sound, size, touch, feel and smell of that particular experience. Minds deal in eternal transsensorially apprehendable, covariant interrelationship principles. We humans were given this capability to function as local-universe problem solvers. We are here to solve evolutionarily occurring unprecedented metaphysical as well as physical problems. We can do so by means of our unique access to the thus far discovered inventory of eternal principles.

Universe is eternally regenerative. Universe is everywhere continually inter-transforming in accordance with the abstract, weightless principles of which (so far as we know) only the human mind has cognizance.

As of the closing of 1974, muscle and power are in complete dominance over world affairs. The world pays two pugilists three million dollars to pummel one anothers' brain boxes for a dozen minutes in front of the T.V. cameras. The winner is officially adulated by the United States Congress. He's a good human being so that's great but no T.V. shows are celebrating far greater metaphysical battle heros and heroines in their silent commitment to love, truth and everyday self sacrifice for others.

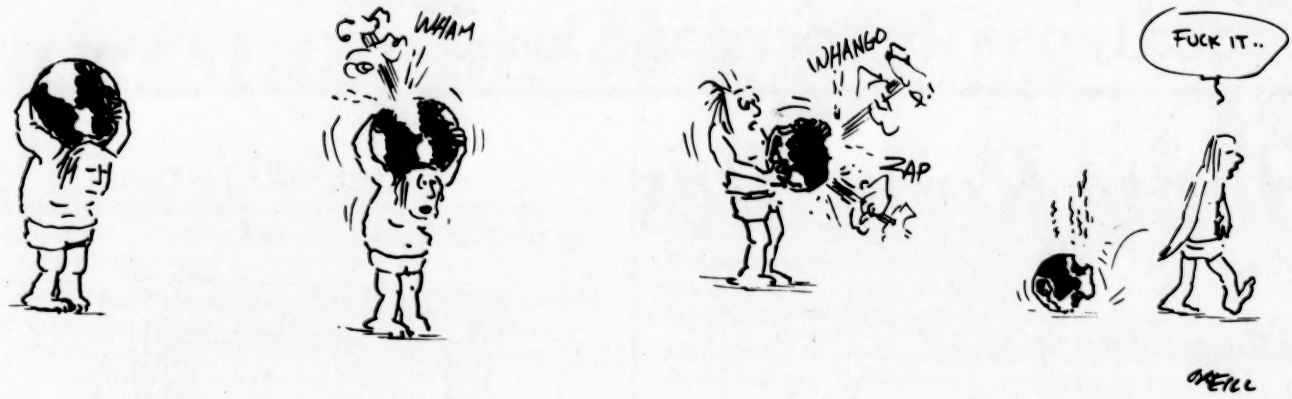
For the last two decades the world powers have been spending 200 billion annually for armaments and only negligible amounts to assuage poverty. The most powerfully armed control the world's wealth. Power and muscle clearly continue in the world's saddle.

Whether human beings will be on our planet in the 21st century depends on whether mind has reversed this condition and has come into complete control over muscle and physical power in general and as a consequence of which the world will at last be operational by humans for all humans.

Humans will be alive aboard our planet Earth in the 21st century only if the struggle for existence has been completely disposed of by providing abundant life support and accomodation for all humans. Only under these conditions can all humans function as the competent local-universe problem solvers. That is what humans were invented for. Only if Abraham Lincoln's "right" has come into complete ascendancy over "might" will humanity remain alive on board our planet in the 21st century and if so will be here for untold milleniums to come. Humanity is now going through its final examination as to whether it can qualify for its universe function and thereby qualify for continuance on board the planet.

It is not necessary to pick the half century away year 2025, to permit enough changes to develop to warrant journalistic reporting of prognostications. It is a matter of human beings getting into the 21st century at all. If we do make it, the acceleration in the rate of occurrence of unprecedented, utterly unpredicted, incredibly great technological economic and social changes will be almost (but not necessarily) devastating.

Human beings are not aboard our miniscule planet just to be pleased or displeased. Humanity's mind-evolved-technology has now photographed a billion



galaxies each of 100 billion stars surrounding miniscule Earth to an observed radius of 11 billion light years, 99.9% of which are invisible to the naked eye. Before the close of the 20th century humans may well be transceiver transmitted from here to there by radio and will be traveling back and forth between the mother spaceship Earth and various local-universe problem centers. Transceived by radio will mean traveling at seven hundred million miles per hour to attend to humanity's local cosmic problem solving functions.

If humans pass their cosmic exam as local universe problem solvers and continue on the planet into the twenty-first century, there will be no thoughts whatsoever of earning a living. There will be no thoughts of, or even such words as business competition, money, or lies for such phenomena will be historically extinct. Such words as politics, war, weapons, debt will be only of historical significance.

Electronic means will have been highly developed for continual inventorying of all of humanity's thoughts, volitions and dispositions regarding all currently evolving problems. Humanity will know at all times what the unique majority volitions may be regarding each and every currently recognized and considered problem.

There will be one world management organization similar to but greatly improved over those of the 20th century U.S.A. "city manager" functions. The one world management will be taking its instructions directly from the computer read-out volitions of the majority. When the majority discovers a given decision is leading humanity into trouble, the popular realisation will be immediately computer manifest and the world management will alter the course accordingly. This feed-back, servo mechanism is the same as that employed in "automatic" flight controls and in the steering of ships. The popular view will be immediately served by the management with no searching for scapegoats when erroneous decisions are discovered and corrected.

All human beings engaged in common wealth production or research and development will be doing so entirely on their own volition because that is what they will want to be doing. They will have to qualify for participation in Olympic games. That which is plentiful will be socialized. That which is scarce must be used only for total advantage and must be used only in the research instruments and tools-that-make-tools which produce the plentiful end-products for humanity.

All of humanity will be enjoying not only all of Earth but a great deal of local universe. "Where do you live?" "I live on the moon," or "I live on Mothership Earth," will be the kinds of answers.

Some large number of human beings will be engaged in archeological research as humanity will want to know a great deal more about the historical occupancy of our planet by humans. The important original buildings of antiquity will be rebuilt or restored as Babylon is now being rebuilt, and artifacts from world around museums will be returned to original sites and reintroduced to function as of yore. Thus research teams can live experimentally at various historical control periods of history thus to elucidate much of the wisdom gained in the past.

While everybody will know much of what everybody is thinking, individuality will not cease but increase. What people are thinking spontaneously as a consequence of the interaction of the unique patterns of their inherited genes and their own experiences will make personalities even more interesting one to the other. Intuition will be fostered. Communication will probably be accomplished by thinking alone, ergo more swiftly and more realistically than by sound and words.

Omni-considerate, comprehensive, synergetic integrity will be the aesthetic criteria and its humanly evolved designs will come to do so much with so very little as to attain the ephemeral beauty heretofore manifest only by nature in her formulation of flowers, crystals, stars and the pure love of a child.

Whether humanity will pass its final exams for such a future is dependent on you and me, not on somebody we elect or who elects themselves to represent us. We will have to make each decision both tiny and great with critical self examination – "Is this truly for the many or just for me?" If the latter prevails it will soon be "curtains" for all.

We are in for the greatest revolution in history. If it's to pull the top down and it's bloody, all lose. If it is a design science revolution to elevate the bottom and all others as well to unprecedentedly new heights, all will live to dare spontaneously to speak and live and love the truth, strange though it often may seem. ■

Home Remedies

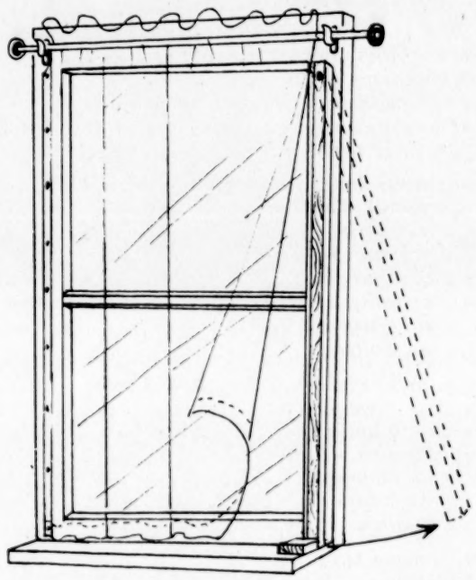
Save Energy: Save Money!

The price is right. Free.

Prepared by the editors of Alternative Sources of Energy *for wide distribution by the Office of Economic Opportunity, this is far the best home energy-conservation book you can get. It's easy to read, easy to apply, full of good ideas. Now if we'll stop applauding and DO IT . . .*

– SB
[suggested by Sam Love]

Save Energy: Save Money
Eugene & Sandra Eccli
1975; 40pp.
FREE
from:
The National Center for Community Action
Network Services: Energy
1711 Connecticut Ave., N.W.
Washington, D.C. 20009
or local OEO office

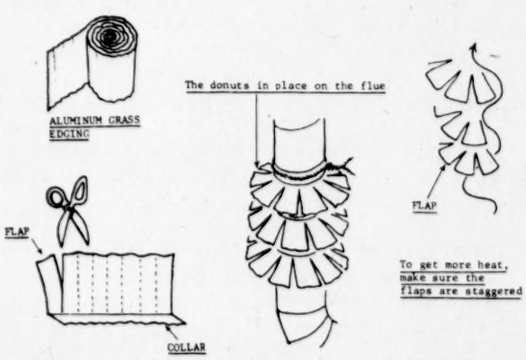


This kind of curtain will really reduce your heating bill. In summer, use it to trap heat at the window and help keep your house cool. Just pull down the top of the window a bit, and the closed curtain will let hot air back out the window in summer.

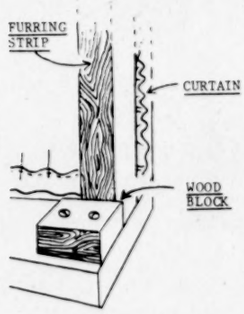
Vacuum dust off your radiators. Dust is very bad. It blocks heat. "Bleed" the radiators to get air out of the system. Open the air valve until water just starts to come out. Then close it tightly. On forced air systems, clean the filters once a month with a vacuum cleaner. Also, vacuum over the outlet to remove any dust or dirt.

•

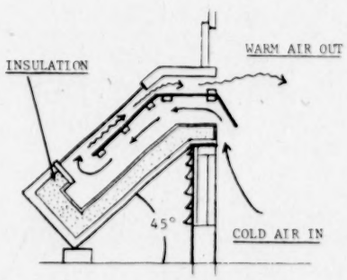
On both furnaces and heating stoves much of the heat goes up the flue and is wasted. You can take some of this back by putting metal "donut rings" on the flue. These give off heat . . . Measure the distance around the flue with a string. Then cut the aluminum into the same lengths. Make a "collar" all the way down the long edge about one inch wide. Now cut the other side into strips every couple of inches. Wrap this on the flue so that collar makes good contact all the way around. Twisted wire is good for this. Don't use anything that could catch fire.

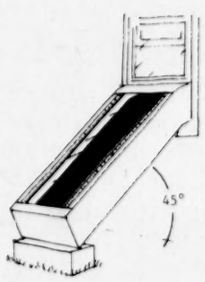


The donuts in place on the flue.



Remember: Put the ideas in this booklet to work for you. You can save as much as $65 out of each $100 you now spend for heat. It's worth the effort!





Understanding Wholesome

Global Reach

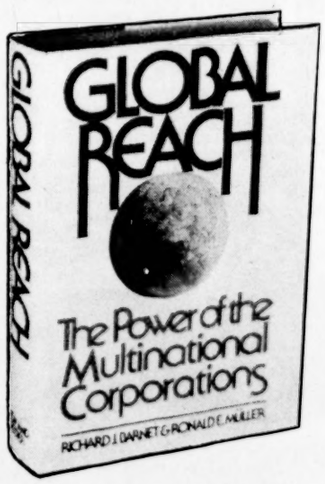
Since the turn of the decade, the collective conscious has become economic. The economy isn't going away in the age of Aquarius, it's going amok.

Yankee theorists are scratching their heads over the failure of Keynesian remedies. **Global Reach** *identifies the ringer: multinational corporations transcend the market's magic regulation. Prices become convenient fictions. Runaway shops nullify labor's countervalence. Global profit maximization has filled the vacuum of one-world ideology.*

Barnet and Muller are political economists. (Remember political economy? That was economics before it was sanitized.) They write well, making intelligible use of statistics. They support their assertions thoroughly, turning up intriguing sources to do so. (For instance, it seems that Latin American economists aren't too proud to do microeconomic research. Their disaggregated information turns out to be revealing in human terms.)

"Efficiency" has excused questionable priorities; Coca-colonization vs. cleaning up village water supplies. **Global Reach** *reckons humans, not mere consumers into the globalized economy. Disparity-wise, it's a grim picture. Having limned the juggernaut, Barnet and Muller make modest proposals for de-fanging it. Not surprisingly, they're decentralists. High time.*

— Stephanie Mills



Global Reach
The Power of the Multinational Corporations
Richard J. Barnet and Roland E. Muller
1974; 508pp.

$11.95 postpaid
from:
Simon and Schuster
Attn: Order Dept.
One W. 39th Street
New York, NY 10018
or Whole Earth

Between 1965 and 1968, 52 percent of all profits of U.S. subsidiaries operating in Latin America in manufacturing — the most dynamic sector of the hemisphere's economy — were repatriated to the United States. This means that for every dollar of net profit earned by a global-corporation subsidiary, 52 cents left the country, even though 78 percent of the investment funds used to generate that dollar of profit came from local sources.

•

The underlying reason for the socially disruptive effects of global corporations is that they are still treated as private organizations despite their increasingly public role. Public authorities are incapable of dealing with them because our laws are still based on the old myths of nineteenth-century free-market capitalism in which private entrepreneurs take private risks for private rewards. But that hardly describes the owners and managers of IBM or Exxon. The free market is largely a historical relic. It has been transformed by three systemic forces over the last 40 years: accelerating concentration of industry and banking, increasing intervention of government into the "private sector," and now the spectacular rise of the intracorporate (nonmarket) economy of the global oligopolies. Together these forces have speeded the decline of the market and further negated its classic social functions.

Earthbound

Park is one of the most distinguished geologists in the country, and a director of a mining company. He was David Brower's worthiest adversary in McPhee's **Encounters with the Archdruid.** *There he emerged as knowledgeable, resolutely practical, hard-thinking . . . compelling.*

Earthbound *is what you'd expect from such a man. Although it assumes that the status quo will likely be more persistent than many would wish (scoffs at windmills, hopes that we'll overcome our childish fears of nuclear reactors, sees very generous profits as vital to extractive industries), it isn't unsound. A certain disagreement with a good author can put a keen edge on one's appreciation of his/her work.*

The substance of Park's book is a quick and lucid introduction to mining — what is extracted from the earth, where it comes from, how it is mined, what it is used for, political situations affecting supplies — in short, a crash course in understanding the skeleton of our civilization. Amply illustrated with graphs, laden with facts, offering a different perspective, **Earthbound** *is a good solid reference book for the eco-catastrophobe.*

— Stephanie Mills

Earthbound
Minerals, Energy, and Man's Future
Charles F. Park, Jr.
1975; 279pp.

$8.00 postpaid
from:
Freeman, Cooper & Co.
1736 Stockton Street
San Francisco, CA 94133
or Whole Earth

There has been, and still is, an unbelievable amount of searching for copper, and there are nations whose entire economies depend upon this metal. We note also that, although available quantities of most of the nonferrous metals have increased in the past few years, greater availability has increased their usefulness. For that reason the demand has increased, so the metals remain in short supply. Substitutes for all uses of these metals have not been found; there is nothing at present that can for all needs take the place of copper or of mercury.

We note also in how many cases the manufacture of these metals requires large amounts of inexpensive energy.

•

Salt is required by all vertebrate animals; all people, from the most primitive to the most sophisticated, eat it, and salt in blocks is commonly supplied for cattle and other livestock . . .

This mineral was important in world and domestic trade in ancient times, when salt and incense were the chief commodities and influenced early trade routes. Salt formed the basis of trade between ports in Syria and the Persian Gulf; salt was traded between Aegean ports and the coasts of southern Russia; the old salt mines of northern India were a trade center before the time of Alexander the Great; and the Via Salaria (the "Salt Road"), along which salt was carried from Ostia to the Sabines, is one of the oldest roads in Italy.

Science and Civilization in China (Vol. V-2)

This volume dealing with Chinese alchemy is impossible to review. Suffice it to say that it is an incredible volume in Joseph Needham's brilliant accounts of Science and Civilization in China. (Earlier volumes in CATALOG, p. 120.) **Spagyrical Discovery and Invention: Magisteries of Gold and Immortality** *is about taoist alchemy and it concerns itself with the physical bases for what, in essence, were mystical quests. For the taoists, what they did with their lives determined the quality of their being; and part of their doing was science.*

This book will irritate people who see their own religious paths as divorced from the material, or the sensual, and it will upset those who do not question their beliefs. But for others seeking holism it will prove a powerful guide. When reading it, be sure and have on hand for reference Professor Needham's Volume 2 **History of Scientific Thought.**

I am coming to realize that what in our times is so often considered the sea of spiritual discovery, is the topmost spray on a scudding wave. Through Needham we can open a portal to view the depths below.

– John Todd

Science and Civilization in China (Vol. V-2)
Volume V: Chemistry and Chemical Technology
Part 2: Spagyrical Discovery and Invention: Magisteries of God and Immortality
Joseph Needham
1974; 510pp.
$35.00
from:
Cambridge University Press
32 E. 57th Street
New York, NY 10022
or Whole Earth

The self-mummified body of Hui-Neng, 6th patriarch of Chhan Buddhism, who died 713 A.D.

We ourselves are aware that the disproportionate size of some of our Sections may give a mis-shapen impression to minds enamoured of classical uniformity, but our material is not easy to 'shape,' perhaps not capable of it, and appropriately enough we are constrained to follow the Taoist natural irregularity and surprises of a romantic garden rather than to attempt any compression of our lush growths within the geometrical confines of a Cartesian parterre. The Taoists would have agreed with Richard Baxter that ' 'tis better to go to heaven disorderly than to be damned in due order.'

•

The three key operational conceptions which we have now described, gold-faking, gold-making, and the preparation of the drug of deathlessness, are, we believe, applicable to all the aspects of early chemistry in every civilisation, and can be relied upon to bring them into inter-relation.

•

There is no dispute that the Taoist Shan Tao-Khai of Tunhuang, who died at Canton in +359, carried out a self-mummification; he was said to have left off cereals for seven years and lived only on cypress cones and pine resin. These things indeed were precisely among the 'foods' recommended about +670 by Sun Ssu-Mo, including also the *fu-ling* fungus, other conifer resins, pine and cypress seeds, and mica powder, made up into jams or pastes with white honey and date pulp. From the +5th century onwards, Ando has been able to record more than fifty cases of self-mummification, nearly all Buddhist, among which are the great founder of the Thien-Thai school, Chih-I (d. +597 or +598), and the Indian Tantrist Subhakarasimha (d. +735). An outstanding example would be that of Hui-Neng, the sixth and last Chhan patriarch (d. +713), whose lacquered mummy can still be seen at the Nan-Hua temple at Tshao-chhi near Chiu-chiang (Kukong). This is reproduced in Fig. 1330, taken from Lo Hsiang-Lin's account of the famous Kuang-Hsiao temple in Canton with which Hui-Neng was so prominently connected . . . .

. . . . Could one, it may be asked, really end one's days this way? It seems that after a long life, with the calm of old age, in the odour of sanctity (as the Taoists and Buddhists understood it), to the accompaniment of the chanting of sutras from *Tao Tsang* or *Ta Tsang,* and surrounded by the wafting of incense, one could. Thereafter incorruptibility guaranteed either rebirth among the *hsien* as a holy immortal, or an entry into some Western paradise, striding along the way towards desired extinction. The relevance of all this for the pre-history of chemistry simply is that whether by arsenical elixir-poisoning or by self-mummification, the continued existence of the body was felt to justify in some measure the Taoist techniques, and that in turn encouraged all those adventures into the understanding of minerals and metals, and plant and animal drugs, which form the content of our history. If the elixirs could be verified by their immediate effects on the patient in the early stages, immortality could be justified at the last by incorruptibility.

Plains of Science, Summits of Passion

BY KENNETH E. BOULDING

Kenneth Boulding, the most cybernetic of economists, does a regular column for MIT's Technology Review. *This is one from the December '74 issue. At the University of Colorado Dr. Boulding is director of the Program on General, Social, and Economic Dynamics.*

Personally I've seen more mystics who are ignorant of science than vice-versa. The best poets and the best scientists I've met find adventure equally in the mountains and the plains.

— SB

The 10 billion neurons of the individual human nervous system, and still more, the 3×10^{19} neurons of the whole human race (about 77×10^{19} if we include all human beings who have ever lived) make a very large habitat in space-time — one that has already developed an enormous complexity of mental species but has yet realized only a small portion of its total potential. One thinks of this as a vast ecosystem populated by images and ideas, perceptions and beliefs, and one perceives science as a small, but very productive sub-ecosystem within this vast habitat. This scientific ecosystem is rather like the agriculture in the Middle West and the Great Plains, surrounded by a vast expanse of the meadows of ordinary experience, the lush forests of religion and art, and the wild glaciers and peaks of ecstacy and agony, mysticism and power, sainthood and devilry.

I happen to live in a marginal ecosystem, where the Great Plains meet the Rocky Mountains and cactus blooms under the ponderosa pine. I have also lived most of my life on the uneasy margin between science and religion. Prickly cactuses of faith also bloom in the level cornfields of economics, cultivated by the uniform technologies of scientific planting and testing. The often conflicting interaction between science and religion has therefore been of great interest to me: I see it in ecological rather than in dialectical terms, not as a battle between two armies — one of which must win and the other lose — but rather like the wavering margin between the cornfield and the forest.

In the last century and a half we have seen an enormous expansion of agriculture, and the forest and the prairie everywhere have retreated before the relentless advance of the field. This is not unrelated to the similar advance in science, which is a kind of mental agriculture, and of government, which is political agriculture. Science raises periodic tables, testable equations, and mechanical and evolutionary models and routs out witchcraft and astrology, alchemy and old wives' tales. Government grows — we hope — internal peace and controlled economies and strives, somewhat less successfully, to rout out crime, strife, and depression.

Nevertheless there are limits to our husbandry in the field, in the laboratory, and in the legislature. We plow up the Great Plains and they blow away; we push agriculture too far into the forests and we create a precarious ecosystem. Agriculture, science, and government all result in a loss of species: An Iowa cornfield has far fewer species than the prairie which it supplanted.

Science is a world monoculture. The mandala of the periodic table appears in chemistry lecture rooms in Peking, Moscow, Rome, Tokyo, Hobart, and Singapore. There is no such thing as Communist chemistry, Catholic chemistry, or Hindu chemistry, white chemistry or black chemistry. Even economics is practiced somewhat furtively in the mathematics departments of socialist universities and Darwinian biology in the laboratories of Catholic universities.

Government likewise tends to create cultural uniformity, at least enough to ensure that everybody pays taxes. Only the nation, the religious sect, and the hippie cult stand between us and world monoculture.

There is something a little frightening in this. If one ecosystem goes wrong in a world of many ecosystems, the others do not; in a world of many isolated cultures, one can collapse, like the Mayan, and the others are quite unaffected. But if the world becomes a single ecosystem with a single culture, then if anything goes wrong everything goes wrong. The Irish potato famine of the 1840s stands as a solemn record of the dangers of monoculture.

But as great as was the Irish catastrophe, it was retrievable because it was local. There comes a point as catastrophe moves toward universality where it becomes irretrievable. In a period of time over which the generalized Murphy's Law holds (if anything can go wrong, it eventually will), there is clearly an optimum degree of diversity from the point of view of maximizing the possibilities of continued long-range evolution.

For those who live out on the great plains of science, where the rich square fields produce increasing yields under the benign inputs of advancing knowledge, it is easy to forget that the plains do not go on forever. The scientist who has never darkened the door of a church, who has never read Gerard Manley Hopkins, or St. John of the Cross, or George Fox, or even Tennyson's "In Memoriam," may be living in a more restricted ecosystem than he thinks. There is a dramatic moment as one drives across the Great Plains where the Rockies first rise above the endless horizon. Even if one never experiences this moment of exhaltation and lives in the middle of Kansas all one's life, it may be nice to know that the Rockies are there. Even if one spends one's whole life raising good, solid, sustaining, scientific wheat, it may be good to know that the fields end somewhere.

At the margins, life can be difficult as well as exciting. There is a constant tension between the urge to go off into the plains and raise solid and nourishing scientific wheat and the contrary urge to disappear into the great gothic forests of the mind and indulge shamelessly in prayer and praise, or even to climb to the icy summits of mystical union. To have a foot in each world can lead to a very uncomfortable straddle, but it does surely lead to a dynamic dance of the mind which is seldom enjoyed by those whose feet are solidly planted in the rich plains. These margins are a good place to live for those who are agile enough to survive in them, and it is necessary for some people to live in them if we are to see the great habitats of the human mind as a totality and not as a set of totally unrelated parts. ■

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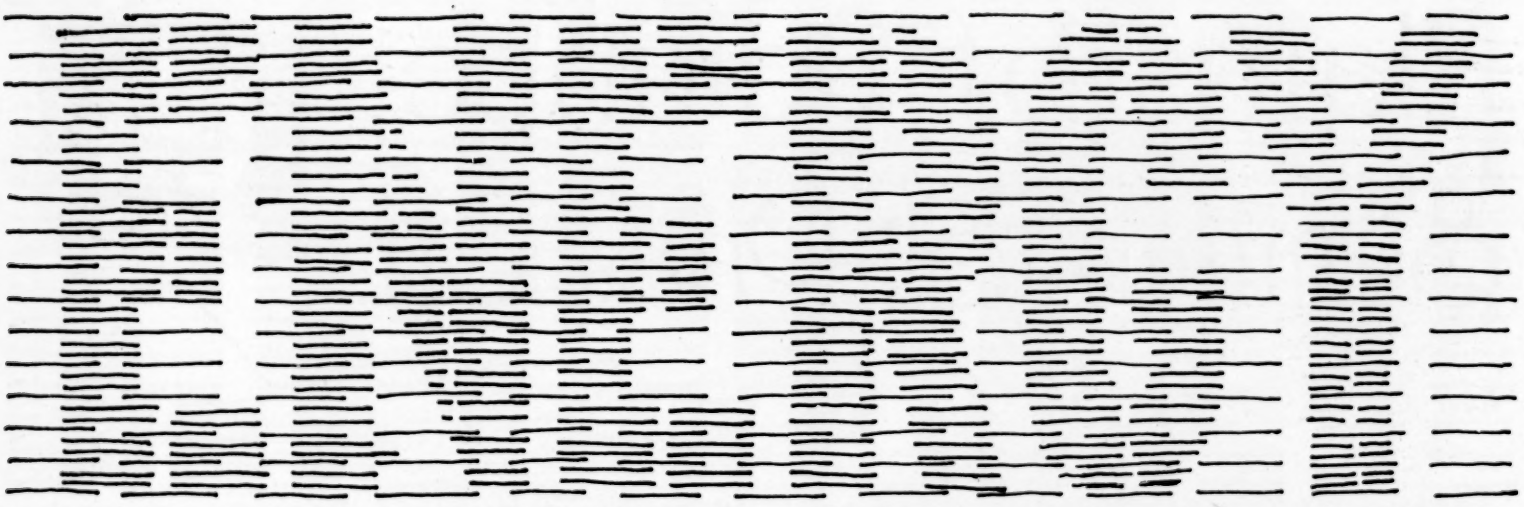


Buckminster Fuller at 80 is in better physical and mental shape than most of my mid-30's contemporaries. He roared through town a few weeks ago, scooped up me and Jann Wenner of **Rolling Stone**, *and riveted our attention to a project of his.*

He began by explaining that his "World Game" idea had been somewhat misused in recent years as an excuse for tech-buff encounter groups. A number of his students and ex-students at the University of Pennsylvania, however, had put in the research time and computer time to come up with a genuine World Game report on energy. "It's first-rate engineering," he said, and showed us the report, **Energy, Earth & Everyone**. *He wanted our advice on how to get the word out. He'd lost patience with New York publishers.*

Jann and I (that's pronounced "yon", by the way) mulled and pondered and had a decision by the end of the salad. Jann's Straight Arrow would publish the book on a rush schedule — pub date by July — and **Rolling Stone** *and* **The CQ** *would each print excerpts. Fuller would write an introduction; I would do an afterword.*

What follows is our excerpt. It is much the handiest reference around to what the real energy choices are — they are wider and deeper than I ever realized. Oil has monopolized our minds as well as our engines.

The book shows how we can completely phase out all energy-use of fossil fuel and atomics by 1985 AND harvest more energy per Earth individual by then than Americans currently misuse.

The principle strategy proposed is conversion to a hydrogen-based energy system using only energy income — sun, wind, temperature difference, etc. — to hydrolize water into the burnable gas hydrogen. For example, electrical transmission towers might drop their wires, acquire wind generators, and pump power into the combination liquid hydrogen pipeline and cryogenic electrical cable at their base.

Getting to the book's optimistic future from where we are also requires extensive local — home and community-level — energy gathering as well as considerable cutting of waste. Past critics of Fuller's sweeping solutions will have a tougher time with this report — their criticism has been incorporated into the scheme. Further critics are invited to participate in the next round of World Game work (see box).

Good book.

— SB

Energy, Earth & Everyone
Medard Gabel, ed.
1975; 192pp.

$4.95 postpaid
from:
Straight Arrow
625-3rd St.
San Francisco, CA 94107
or Whole Earth

EDITED BY MEDARD GABEL

1
Coal

Coal is a capital energy source; the most abundant of the fossil fuels. It is the product of tremendous pressures that over millions of years have transformed organic materials into a concentrated hydrocarbon form. Combusted coal releases its stored chemical energy. Coal can be gasified and used in place of natural gas. There are many different forms of coal gasification, but most are inefficient because the power demanded to produce the gas is more than the amount of energy obtained from the gas. Coal liquification is a process where coal is gasified with oxygen and steam to produce gaseous and liquid hydrocarbon products ranging from wax to light oils. (Germans used this process in World War II to fuel tanks and aircraft.) Coal is used as a fuel for electric power generation, household heating and cooling, and blast furnaces. In its liquid and gaseous form it is used for fuel for electric power generation, blast furnaces, transportation, locomotives and shipping. Its uses as a raw material and its by-products are for insecticides, margarine, plastics, coke, coke tar, dyes, nylon, perlon, glue, cosmetics, fertilizers and lignite.

HISTORY

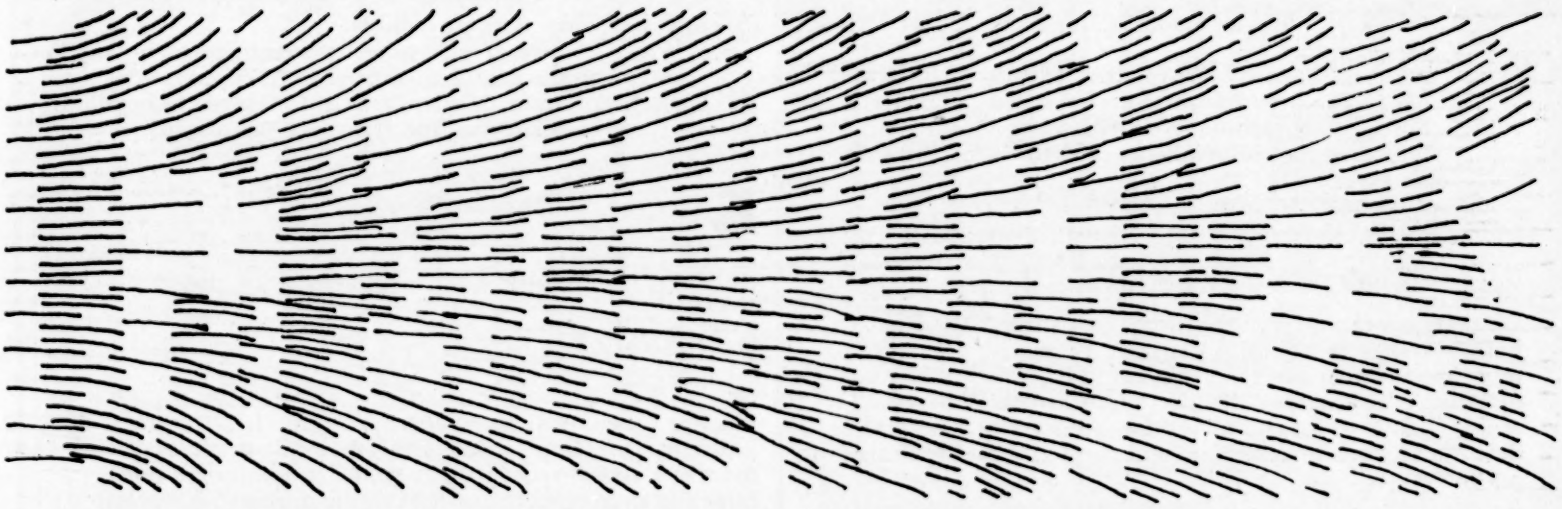
1000: Hopi Indians mine coal and use it to heat their homes and fire pottery.
1735: The Darby blast furnace.
1745: Coal mining begins in U.S.A.
1856: Coal tar dye industry begins.
1867: Mauve dye industry starts.
1868: Red dye industry starts.
1897: Indigo dye industry starts.
1901: Bohn's inanthrene dyes.
1930: Nylon.

ADVANTAGES

1. It is the most abundant of the fossil fuels.
2. Its stored energy is easily released.
3. It is easily stored, transported and controlled in large volume.

DISADVANTAGES

1. Once combusted, it is gone forever.
2. Environmental dangers include:
   a) Combustion releases large amounts of waste heat, sulfur dioxide, particulate matter, and carbon dioxide. There are methods and devices to control pollution from stacks after combustion; and methods for the gasification of coal to produce a cleaner fuel. By present day accounting, these are very expensive.
   b) Mining of coal in deep mines is dangerous to life and health; surface (strip) mining damages the land, produces soil waste problems, acid drainage, unproductive land, and visibly ugly terrain.



c) The process of coal gasification and liquification uses vast amounts of water.

3. Low efficiency (from underground mine to user of electric power - 18%; from surface strip mine to user of electric power - 25%).

2 Petroleum

Petroleum is a capital energy source; a fossil fuel. Like coal, it is a product of millions of years of pressure that has transformed organic materials into combustible hydrocarbons. We combust petroleum to release its stored chemical energy; it is presently the principle source of energy in the world. It is used as a fuel for space heating, transportation, and electric power generation. It is also used as a raw material in the manufacturing of many products such as fertilizer, plastics, naptha waxes, medicine, lubricants, coke, asphalt, etc. At one time there were an estimated 2,000 billion barrels of oil on Earth. To date (1974) humanity has consumed 300 billion barrels.

HISTORY

6000 B.C.	Mesopotamia. Asphalt used as fuel.
3000 B.C.	Mesopotamia. Flares of natural gas lit in temples.
1000 B.C.	China. Wells drilled down to depths of 3,000 feet for producing natural gas, which was transported in bamboo pipelines for lighting and space-heating.
300 B.C.	Mesopotamia. Fires of fluid naphtha used for military purposes.
Before A.D. 500	North America. Hand-dug oil-wells drilled by Indians.
Before A.D. 1000	Mexico and Peru. Petroleum and asphalt used as fuel.
A.D. 1000	Burma. Wells drilled for petroleum production.

Petroleum Production Began:

1300	Baku (now USSR)
1692	Peru
1750	Galicia (now Poland)
1852	Lukasiewcz invents kerosene lamp, refines crude oil
1859	Pennsylvania. Drake drills first oil well.
1876	California
1887	Texas
1893	Sumatra
1893	Dutch Borneo
1901	Mexico
1905	Oil burning steamer
1908	Iran. Gasoline powered Model T Ford.
1909	Trinidad
1910	Oil cracking
1913	Venezuela; British Borneo
1927	Iraq
1932	Bahrein
1938	Austria; Saudi Arabia; Kuwait
1940	Qatar
1967	Alberta tar sands oil production begins

World Game Studies Workshop

The purpose of this international, multidisciplinary workshop is to provide participants with a working understanding of what R. Buckminster Fuller calls, "Comprehensive Anticipatory Design Science" — the effective application of the principles of science to the conscious design of our environment. The approach involves understanding the critical interrelated nature of our problems and their global scope. The inability of present methods of planning to deal effectively with these problems are viewed in the light of new alternative approaches for recognizing, resolving and preventing present and anticipated problems.

This year the workshop will be held in Philadelphia, Pennsylvania, U.S.A., from June 21st through July 18, 1975.

Week one, the orientation session will equip participants with a comprehensive introduction to Design Science via an intense schedule of lectures, seminars, films, video tapes, games and discussions. As in previous World Game Studies Workshops, there will be lectures by Buckminster Fuller and other specially chosen lecturers on the general topics of Design Science, the World Game, global perspectives on humanity's problems, general systems theory and its applications to global problem solving, world resources/human trends and needs, global energy development, futures studies and alternatives to present economic practices.

Week two through four will consist of an exploration with the applications of Design Science — the philosophy, theory, methods and procedures presented during week one — towards the development of alternative strategies for resolving critical global problems, such as the food shortage.

Participants may register for Week One orientation only or for the complete Four Week program of orientation and Design Science Project.

Cost: $350 — Full Workshop Program
$150 — Orientation Week only

For applications and further information write:
Workshop/Earth M.D.
Box 2016 Yale Station
New Haven, Ct. 06520 U.S.A.
Phone 203/776-4021

ADVANTAGES

1. Its stored energy is easily released.
2. It is easily mined; a Mid-East oil well can flow at a rate of 10,000 barrels per day at a "cost" of 10¢ per barrel.
3. It is easily transported, stored and controlled.

DISADVANTAGES

1. Once combusted, it is lost forever.
2. There is a short supply; at present increasing rates of combustion, by the year 2000, world oil will be gone.
3. The supply potential is unsure and unstable due to political factors.
4. It is not found in many places around the world.
5. Environmental dangers include:
   a) Atmospheric pollution from: carbon dioxide, carbon

monoxide, nitrogen oxides, sulfur dioxide, particulates and aldehydes.
b) Ocean spills; petroleum-related pollution of lakes and rivers. The environmental impact of oil can be reduced through such techniques as hydrogenation to yield sulfur-free fuel gas, emission control devices for cars and industry.
c) Waste heat

2A Oil Shale and Tar Sands

Oil shale is a capital energy source: it is shale in which a petroleum-like substance is trapped. To get oil, the shale must be mined, crushed, and heated to 900° Fahrenheit in a retorting process where the solid organic material in the oil shale converts to gas and oil vapors. Another process is to heat the oil shale underground and pump out the resulting gas and oil.

Tar sands are similar to oil shale; petroleum is trapped within sand rather than shale. Oil is drawn in much the same manner as from oil shale. The tar sands of Alberta, Canada have been in limited production since 1966 and are now about to enter large scale production for United States markets. World reserves are approximately 1/5 to 1/7 those of liquid petroleum in gross energy. Net energy reserves are much less.

ADVANTAGE

1. Increases the oil supply.

DISADVANTAGES

1. High amounts of energy are needed to get it; the net energy may not be enough to warrant extraction.
2. Vast quantities of shale must be mined to produce significan quantities of oil; one ton of oil shale will yield 25-30 gallons of oil.
3. Volume of original rock material is increased by as much as one half; consequently, a place must be found for the overburden and mine tailings.
4. The high salt concentration of waste water from the process.
5. Revegetating and controlling leaching from spent shale deposit sites.
6. Resource must be located near source of water for economic production of liquid fuels; most oil shale is not near water.
7. Emissions to the air and change in local topography and wildlife as a result of oil shale mining and production.

3
Natural Gas

Natural gas is a capital energy source; a fossil fuel. It was formed as the product of millions of years of pressure on organic materials. It is a mixture of gaseous hydrocarbons, predominantly methane; it is combusted to release its stored chemical energy. It is used as a fuel for space heating, cooling, transportation, and electric power generation.

ADVANTAGES

1. Its sulfur-free combustion makes it the cleanest of all fossil fuels.
2. It is easily stored, transported and controlled in large volumes.

DISADVANTAGES

1. Once combusted, it is gone forever.
2. It is in short supply; known and available deposits of gas leave only about 11 years of gas left in the United States at current output. The world will run out in 1991. Ways to get more gas (into the United States) would be to import a liquified natural gas (LNG) from foreign sources; to gasify coal, or extract methane from organic waste and refuse.
3. Environmental dangers include:
   a) When burned in large power plants the high temperatures produce large quantities of nitrogen oxides.
   b) In liquified form, there are risks involved in handling (vapor clouds, fire, and flameless explosions).

4
Nuclear Fission

Nuclear fission is a capital energy source. It is the result of uranium being bombarded with subatomic particles called neutrons, which subsequently split the uranium in two, releasing large amounts of heat in the process. A nuclear reactor is a device for the controlled "burning" of a nuclear fuel – just as the standard coal-fired thermal-electric power plant is a device for the controlled combustion of coal. There are two types of fission reactors under consideration. Conventional reactors consume fissionable materials such as U-235. Radioactive materials produced are considered as waste. Breeder reactors produce fuel by neutron bombardment while consuming the original fuel supply. Conventional reactors have the obvious drawback of consuming the Earth's very limited supply of fissionable fuels. Breeders solve the depletable resource problem by producing more fissionable fuel than they consume; however, like the conventional reactor, they both produce exceedingly toxic radioactive wastes which must be safely disposed of and monitored where stored. In addition, there are a number of operational difficulties with breeder reactors, particularly with cooling systems. Failure of the cooling system will cause the reactor core to melt. Temperatures rise rapidly to the point where surrounding structures will also melt, and finally there is an atmospheric release of steam and gas which sends a cloud of radioactive material over a wide area.

HISTORY

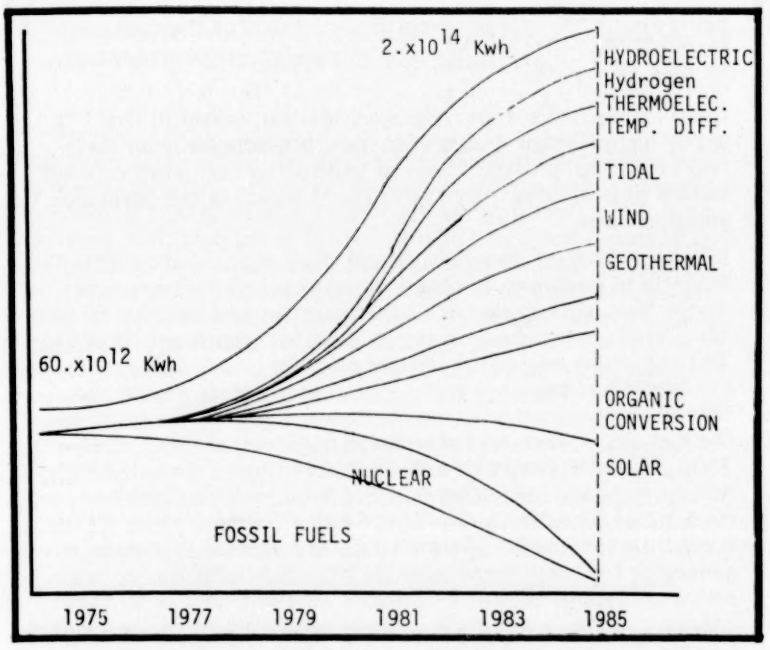
Some Prototypes:

1942:	Chicago, USA; first atomic fission reactor under the direction of Fermi.
1945:	Alamogordo, New Mexico, USA; first fission explosion.
1954:	USA; first nuclear powered submarine (Nautilus)
1957:	England; first controlled fission reactor (Calder Hall).
1960-1965:	U.S. Atomic Energy Commission oversees development of fission reactor technology for electrical power generation.
1966:	Near Detroit, Michigan, USA; Fermi laboratory near "melt down" accident in A.E.C. developed breeder reactor.
1970-present:	Fission produced electricity becomes "economical" and a large number of plants begin construction.

USES

Nuclear technology is used or can be used for the following:

1. Generation of electricity
2. Desalination – principally for municipal and industrial uses
3. Radiation entomology
4. Pesticide residues and food protection (i.e., sterilization of fruit flies)
5. Plant breeding and genetics
6. Animal protection and disease control (i.e., parasite irradiation)
7. Food irradiation – to improve storage life
8. Nuclear medicine
9. Radiation biology
10. Radiation dosimetry (i.e., standards of measure for radiation dosage)
11. Hydrology
12. Industry (i.e., mining of natural gas)
13. Weaponry



ADVANTAGES

1. Substitution of locally concentrated waste by-products (radioactive) for the more diffuse emissions of conventional fossil fuel power plants.
2. Life expectancy of the remaining fuel supply (for breeder reactor).
3. Low upkeep and overall operating costs.
4. Concentrated fuel supply — one ounce of uranium has roughly the same power potential as 100 tons of coal.

DISADVANTAGES

1. Environmental dangers include:
   a) Releases large quantities of waste heat; more so than conventional fossil fuel power plants.
   b) Produces some of the most toxic substances known to man in the form of nuclear waste; endangering health via: genetic mutation, cancer, and radiation burns. These wastes must be stored for hundreds of thousands of years before they become non-toxic to humans; containers for storage last decades, while toxicity lasts for centuries.
   c) Accident and sabotage risks are high; also, nuclear materials can be diverted for use in nuclear weapons.
2. Large initial capital investment to build plant.
3. Short supply of uranium fuel — merely 20 years' worth of uranium is left (without breeder).
4. Low thermal efficiency — 33%.

5
Hydroelectric

Falling water is an income energy source. Hydroelectric power is the conversion of the gravity pull of falling water of rivers and controlled release water reservoirs through turbine generators. This provides a clean, efficient means of producing electrical power. Hydroelectric power does not alter the energy balance of the Earth, and does not return pollutants to its environment. Currently, hydroelectric plants produce 2.3% or 1.2×10^{12} Kilowatt hours per year of the total global energy production. It is estimated that the undeveloped global hydroelectric potential is 5×10^{12} to 50×10^{12} Kilowatt hours per year. South America, Africa, and Southeast Asia contain, respectively, 20, 27, and 16% of the world's theoretical hydro-capacity.

ADVANTAGES

1. No fossil fuels are consumed (in electrical energy production).
2. Production costs are low: .6 to 1.6 mills per Kilowatt hour.
3. Conversion of force of water to electrical energy produced is 90%.
4. Hydroelectric generation produces no chemical or thermal pollution.
5. Hydroelectric plants can be used to produce (electrolytically) hydrogen.

DISADVANTAGES

1. Construction cost per installed Kilowatt capacity is high: $100.00 to $600.00 per Kilowatt.
2. Damming of rivers causes changes in the ecological cycles of the rivers and surrounding landscape.
3. Sedimentation and silt accumulation back-up progressively affects rivers' flow and land drainage patterns.
4. Shortage of feasible sites.

HISTORY

B.C. : Water wheels
1000: Water driven blast furnace
1500: Water pumping works
1885: First hydroelectric plant

6
Geothermal

Geothermal power is an income energy source; it is the heat from inside the Earth, tapped at shallow depths as dry steam, hot brine, hot dry rock, pressurized liquid, or magma. It is from this stored thermal energy that power is derived. With present technology, geothermal power is classified as a "capital" energy source but has the distinct capability of becoming an income energy source with the advent of new technological developments. The potential for generating electricity is well established and is undergoing significant development. The extent to which geothermal "oceans" underlie the Earth's land masses, however, is a matter of considerable speculation. Sources are reported on all continents except Antarctica although only unsystematic searches have been undertaken. Prospecting techniques are only beginning to be developed and it might be speculated that existing estimates are extremely conservative in lieu of limited data upon which they are based.

The technology for converting steam sources is very well developed, it eliminated the procedure of refinement and distribution needed with fossil-fueled thermal plants by directly providing the steam which would otherwise be artificially created from water by the combustion of fossil resources. A relationship of known geothermal sources with the earthquake regions of the Earth raises questions as to the relationship of large-scale geothermal mining and increased earthquake activity. Dr. Robert Rex of the University of California at Riverside, however, speculates otherwise . . . "geothermal fluid withdrawal would probably tend to diminish earthquake hazards rather than enhance them."

USES

1. Electric power generation
2. Heating and cooling for space and industrial processes

HISTORY

1904-present: Laradello, Italy: electricity generated from a geothermal source. Though capacity was extremely small with the initial installation, capacity is presently 405.6 Megawatts, providing the power for much of the nation's railroads.

1925-present: Iceland: large-scale use of geothermally-originated hot water used for domestic heat. Iceland's fields were estimated in 1954 to have an electric generating capacity of 300 Megawatts.

1960-present: Sonoma County, California: "The Geysers" plant built by Pacific Gas and Electric

Company which has been enlarging the plant's capacity ever since. Present capacity: 516 Megawatts; 1976: 900 Megawatts; ultimate capacity: more than 1000 Megawatts.

1961-present: Matsukawa, Japan: 20 Megawatts power plant.

1971: Riverside, California: Dr. Robert Rex (University of California) estimates Imperial Valley (California) geothermal "ocean" at a 20-30,000 Megawatt capacity.

1974: The Soviet Union announces a major plan for exploration of geothermal resources in its eastern regions. Geothermal energy potential of the Soviet Union is greater than all other Soviet energy resources combined.

Other geothermal sites: Wairakei Field, 192 Megawatts and Kawerau, New Zealand; Otake, Japan; Pauzhetzka and Paratunka, USSR; Cerro Prieto, Mexico; and Namafjall, Iceland.

ADVANTAGES

1. Plentiful supply: 13% of the total heat from geothermal sources if converted to electric power could produce 10 times the world's present power output (580 trillion Kilowatt hours).
2. Lower costs than comparable size plants utilizing fossil or nuclear fuels; estimated costs range from 2-12 mills per kilowatt hour.
3. Less time for plant set-up: three years from planning to become operational (15 years for nuclear power plants).

DISADVANTAGES

1. Environmental dangers include:
   a) Disposal of waste water with high mineral content. (It can be anticipated that geothermal mining will reach a point where it will be economically expedient to distill the mineral-rich wastes in order to retrieve many of the chemicals.)
   b) Disposal of hot water produced by condensation in the conversion process — now discharged into nearby rivers. (This can be eliminated by forcing the waters back down to the "ocean" from which they were mined; thereby also increasing the expected life of the well.)
   c) Noxious gases released to the atmosphere: i.e., sulfur, ammonia, boron.
2. Lower efficiency: In an isobutane unit (secondary heat source) unit about 30% of the output is used to run pumps and other equipment as compared with 8-10% in a fossil fuel unit and 10-15% in a nuclear fission plant.

7
Organic Waste and Refuse

Organic waste and refuse are income energy sources. Much of the solar and chemical energy that went into the production of plants and manufactured goods still remains in organic waste and refuse when it is disposed of as no longer "useful" (approximately 4500-7500 BTU/lb of municipal refuse). If this energy could be reclaimed, it would represent an amazing increase in the efficiency of our overall energy use. Present technology is providing means by which agricultural wastes and urban refuse can be converted into useable fuels and fertilizer instead of littering the landscape with garbage dumps or smudging our skies with incinerator smog.

Destructive distillation (pyrolysis), chemical reduction, and bio-conversion are the three principal means of converting wastes to fuel. Destructive distillation has long been used to produce Methanol from wood; it has also been used experimentally to produce synthetic natural gas (SNG) and other fuels from cow manure and urban refuse. Since pyrolysis involves the application of high temperature and pressure to bring about thermal decomposition, much of the fuel produced is used in the process, making it an expensive means of fuel production.

Chemical reduction, or hydrogasification, is still in the experimental stage, but preliminary projections promise it will be an economical means of producing fuel from organic wastes through treatment with H_2 at elevated temperatures and pressures.

Bioconversion, or anerobic digestion, is the use of anerobic bacteria to naturally decompose wastes into methane and sludge that can be used as a high nitrogen and mineral fertilizer. This process has long been used for treatment of sewage. The Hyperion sewage treatment plant in Los Angeles, California has been using the methane generated from the sewage-to-power-to-treatment plant and selling the extra to the municipal electrical generating plant since 1950. Over 2500 Biogas^{tm} plants have been built in India since the mid 50's to process cow dung and produce methane gas for cooking and heating. The simplicity of this process makes it possible for almost anyone to build a workable methane generator for small farm use. No high temperatures or pressure are needed, but rather only an air-tight tank where the anerobic bacteria can grow without exposure to oxygen and be kept at a constant temperature of 90° - 95° Fahrenheit. The use of Biogas^{tm} as a process to produce synthetic natural gas from municipal wastes has been thoroughly explored and shown to be a profitable means of recycling the metals and glass contained in mixed garbage as well as producing fairly inexpensive SNG.

Enormous amounts of waste materials are available for potential conversion to gas; however, the efficiency of collection is only about 20%. Even so, if all the world's manure and municipal wastes were collected at this efficiency, treated using anerobic digestion, it would produce enough gas to generate approximately 8×10^{12} kilowatt hours.

ADVANTAGES

1. Abundant and regenerative supply found wherever humanity or associated life forms are found.
2. Easily used by present energy conversion engines.

DISADVANTAGE

1. High initial cost of conversion facility.

8
Algae Bacteria Agriculture

Algae growth is an income energy source. Wood, still used as a major energy source, especially in developing countries, comes from forests that are approximately 1% efficient in storage of solar energy. Algae, single-celled green plants, however, can be between two to thirty percent efficient in their conversion of solar energy to cellular energy depending upon conditions.

In order to take advantage of this large potential power source, a system has been devised by which algae is grown in large shallow tanks exposed to the sun, and then collected and fed to methane-producing anerobic bacteria. The residue from the methane digester serves as an ideal nutriment solution for algae growth and the carbon dioxide and water produced from the combustion of methane are also used in production of algae, making the whole cycle almost a closed system except for the input of solar energy. What little is lost can be replaced by the occasional addition of untreated sewage. According to calculations, such a system could produce a continuous 15 kilowatts per acre, given a minimum solar input of at least 200 langleys per day. Given the simplicity of the necessary hardware and the minimum material

input required, vast areas of presently barren land could easily be used for large scale power production.

Another source of photosynthetic energy is the algae, Chlorella. Under laboratory conditions a reproduction rate has been achieved corresponding to an annual acre-yield of some 75 tons dry weight of Chlorella. With a heat value of between 9,000 and 13,600 BTU per pound, the Chlorella can be made into alcohol or burned directly as a fuel. Almost 550,000 kilowatt hours per acre per year could be generated in this manner. 106 million acres' worth of Chlorella would need to be produced to obtain all the energy presently used by the entire world. As Chlorella is grown hydroponically, this does not have to be prime farm land, but rather waste or semi-arid land, or even the oceans. Also, an acre does not have to be horizontal, but could be somewhat vertical. That is, multistoried automated greenhouses could contain many acres of algae production on an acre of land. Utilizing just the semi-arid regions which would be suitable for Chlorella production (see map), $1,248 \times 10^{12}$ kilowatt hours annual gross energy could be obtained.

Due to the growing recognition of the importance of hydrogen in our future energy economy, there has been increased interest and research in the area of direct hydrogen production by photosynthetic algae. Although it has been known since the forties that certain kinds of micro-organisms will photo-produce molecular hydrogen, thus far all work in this area is still on the experimental level with no prototypes for practical application yet produced. Recent research promises that this technique may be able to produce sufficient hydrogen to meet the energy needs of an entire household using an area of only a few square meters for algae growth. (See algae critical path for illustration.)

Another way in which the photosynthetic cycle can be utilized as an energy (and material) source is in the production of sugar via the sugarcane or sugar beet plant. Sugar from these highly efficient plants could be: a) burned (it is a carbohydrate and has the same caloric content as sugar) or b) converted to alcohol. "In this process the thermal efficiency is very good, with practically no loss in going from sugar to alcohol. It takes 12.9 pounds of sugar to make one gallon of alcohol, that is 64¢ worth of sugar at 1971-72 prices of sugarcane to make one gallon of alcohol. It costs about 20¢ to convert the sugar, making a total of 84¢ per gallon by fermentation. If the sugar planters in Hawaii, whose gasoline is now rationed, would convert about one third of their molasses directly into fuel alcohol, they would not have to purchase the 15 million gallons of petroleum which they now do to run their agricultural machinery . . . In Nebraska, which has about 7 million bushels of spoiled grain per year, this should yield more than 20 million gallons of alcohol."

Another use of the photosynthetic cycle would be as a source for hydrocarbons for use in chemicals and materials. The Hevea rubber plant which was first found wild in Brazil and now is grown almost exclusively in plantations in Malaysia and Indonesia is a source of hydrocarbons.

8A Wood

Wood is an income energy source. Wood is constantly being replenished as forests continue to impound the sun's radiation. In 1850, 90% of the fuel burned was wood; in 1945 it was 5% and still diminishing. This lasted until the easy access forests were eliminated and energy demands rose above what could be provided by wood. Recent uses of wood as an industrial fuel have included its use as a source of "producers" or "wood" gas during World War II to power automobiles and trucks. Individual vehicles were fitted with special ovens in which incomplete oxidation plus dry distillation of the wood would take place. By mixing this gas and air an explosive gas results which can be used in ordinary internal combustion vehicles in place of the usual mixture of air and gasoline vapor. Unfortunately, the energy content of this fuel is not too high. Besides its limited use as a fuel, wood is in high demand as a source of material for building and paper.

ADVANTAGES

1. Readily available
2. Constantly replenished

DISADVANTAGES

1. Low heat value
2. "Harvesting" damages terrain and ecology

9 Wind

Wind power is an income energy source; it is continually regenerating in the atmosphere under the influence of radiant energy from the sun. The atmosphere is a huge storage battery for the sun's radiant energy. About 2% of all solar radiation to the Earth is converted to kinetic energy in the atmosphere. The amount of this energy available for useful work for humanity is more than might be supposed from an analysis of the energy contained in just the lower 150 meters of the atmosphere. The reason for this is that as energy is removed from the winds close to the ground, kinetic energy is transferred downward from higher altitudes.

Wind power turns vanes, blades, or propellers attached to a shaft. The revolving shaft spins the rotor of a generator which produces electricity. Wind power is used for electrical power generation, water pumping, electrolysis, and mills. A reasonable blade diameter for central generating station units is in the neighborhood of 150 feet. This is well within the capabilities of the helicopter rotor industry at the present time.

HISTORY

1000 BC-present: Wind-powered sailing ships.

1850: Use of windmills in America equivalent to 1.4 billion horsepower hours of work, or 1.04 billion kilowatt hours.

1894: First use of wind for electric generation by the Arctic explorer Narsen.

1929-?: Bourget, France; Electric wind turbine, 20 meters in diameter, capacity not known.

1931-?: Near Yalta, USSR; Electric wind turbine, 100 feet in diameter, 100 kilowatt capacity.

1941-1945: Grandpa's Knob, Vermont, USA; Electric wind turbine, 175 feet in diameter, 1250 kilowatt capacity, constructed by the S. Morgan Smith Co. and designed by P.C. Putnam. Energy cost: 3 mills/kilowatt vs. 2.5 - 6.0 mills/kilowatt of fossil fuelled power plants (1945 prices).

1950: 10 kilowatt Hutter wind generator mass produced in Germany.

1951: Thomas 6500 kilowatt wind generator designed; featured two 200 foot blades atop a 475 foot tower.

1954: The USSR revealed the number of wind power plants operating in the country as 29,500 with an aggregate capacity of 1.1×10^9 kilowatt hours.

1957: Gedser Windmill; fully automated 200 kilowatt unit with 3 blades 45 feet long and mounted on a 75 foot prestressed concrete tower. By 1961, the unit had produced over 400,000 kilowatt hours per year for the Danish Public Power System. Mass produced, it would cost $40,000.

1945-60: 100 kilowatt wind generator built at Enfield-Andreau, England.

1960: Hutter-Allgaier 100 kilowatt wind generator built.

1960: 600 kilowatt Gedser wind generator designed.

1970: Heronemus proposes Shoreham plan; 2 networks of floating wind power stations off Long Island. Each station would support 3 wind towers, each having two 200 foot wind turbines. Costs competitive with future costs of conventional power systems.

1972: Heronemus proposes wind generator forest of 300,000 windmills for the Great Plains; 180,000

megawatt capacity, $100. per installed kilowatt excluding land.

1973: Schonball 70 kilowatt wind generator (power supply for five families). Estimated cost of mass production: $32,200.

1974: NASA testing 100 kilowatt generator - Lewis Research Center; initial phase of program that could produce generators of megawatt capability.

1975: 100 kilowatt wind generator built by NASA; 125 foot diameter, 2 bladed propeller, and a 125 foot tower; prototype for much larger units (1000 kilowatt +).

1976: Block Island Power Co. (Rhode Island, USA) will receive 60% of their power from wind generators by 1976.

Note:
NSF and NASA have suggested that a major American development program in wind power could result in an annual yield of 1.5 trillion kilowatt hours of electricity, the amount of electricity consumed in the USA in 1970.

ADVANTAGES

1. Wind is everywhere, free and plentiful; the wind power available in the conterminous United States is 13 Kw/hectare (about 3504×10^{12} Kwh). Average wind energy in the Oklahoma City area is about 18.5 watts per square foot of area perpendicular to the wind direction. This is roughly equivalent to the amount of solar energy that falls on a square foot of land in Oklahoma - averaging the sunlight for 24 hours a day in all seasons and under all weather conditions.
2. No damage to surrounding environment; no waste heat, discharge, etc.
3. No addition to thermal burden of the Earth.

DISADVANTAGES

1. Relatively small power outputs.
2. Variations in power plant output due to flux in duration and intensity of wind necessitates storage facilities.
3. Wind must move at speeds greater than 7 m.p.h.

10
The Tides

The tides are an income energy source that is continually regenerated through the combined kinetic and potential energy of the earth-moon-sun system. The twice daily rise and fall of the sea causes an oscillatory flow of water in the filling and emptying of partially enclosed coastal basins. The tides can be utilized to produce hydroelectric power by damming the basins and the tidal flow regulated through gates to run turbines. Two-way turbines have been developed that can be activated as the tide flows in either direction. The turbines can also act as pumps and the basin can be used to store water to be released during peak periods of energy usage.

The amount of energy derived from a plant may be large, but viable sites lie in a limited number of locations. Viability is determined by the height of the tidal range (present technology calls for a minimum range of 10 feet), the size of the basin area, and the length of barrage necessary to enclose the basin. There are approximately 100 sites in the world which are suitable for large tidal plants. Some of these plants could be coupled for greater efficiency and productivity. "Apart from large scale schemes, there appears to be good scope for small tidal installations of one to ten megawatts on the coasts of countries lacking in power sources. The power from such installations can be fed into an electric power grid, if one is available, or used for intermittent operations." The ultimate potential amount of energy from the tides around the world is 8.76×10^{12} kilowatt hours.

The 240,000 kilowatt Rance River Tidal Plant in France, the largest in the world, was built in six years. The life of a plant is determined by how long it takes for silt to fill the reservoir. The Rance plant is expected to last 50 to 75 years. Great Britain has studied the projected construction of an 800,000 kilowatt tidal plant for the Severn River at Bristol Channel three times, in 1918, 1933, and 1945. If the 1933 or 1945 projects had been done, they would have paid for themselves within ten years.

Of the 100 sites in the world suitable for large tidal plants, only some are near populated areas that would be able to absorb the power produced by the plant. A strategy has to be devised at each location to determine the most efficient way to use the maximum amounts of potential energy available; that is, where and how many barrages are to be built, how many turbines can be supported, etc. A strategy may be worked out at a given site that would provide energy during on and off peak periods. It may be desirable during off peak periods to switch from generation of electricity into a power grid system, to production of hydrogen, which is more easily stored than electricity.

USES

1. Electric power generation
2. Hydrogen production

ADVANTAGES

1. No waste heat, effluents, discharge, or serious bio/geochemical damage or danger to marine ecology.
2. Transportation links can be established across barrages to connect coastal areas otherwise unconnected.

DISADVANTAGES

1. Costs of construction are generally not competitive with conventional energy plants, due to problems of construction on water-covered sites.
2. While tidal plants produce no pollution, they might create or aggravate a problem of build-up of river pollution that would normally dissipate out of the basin.

HISTORY

Ancient Egypt: Used tidal powered paddle wheels to harness the tide to irrigate crop lands.

1600: Tide mill pump.

1856-1939: 280 patents relating to the utilization of tidal energy registered.

1966-present: Mouth of Rance River, near Normandy, France: using a series of 24 10,000 kilowatt turbine generators.

1969-present: Kislaya Guba on the White Sea north of Murmansk, USSR: a successful 300+ kilowatt tidal plant developed as the prototype for a 1500 kilowatt plant now under construction at Mezen as the initial phase of a network in the White Sea area to generate 6000 kilowatts from a series of tidal plants.

11
Ocean Waves

Wave power is an income energy source; various proposals have been put forward to harness it. One scheme is to have each incoming wave force water, by means of valves and pressure chamber, into a tank above sea level. This water in turn would run a turbine on its way back to the sea. Or, a battery of floats would be mounted along the shore, each float connected with the shore by a long boom. The oscillating motion of these booms would turn a generator. Another scheme, proposed by Buckminster Fuller, involves a floating breakwater which would simultaneously protect the shoreline and generate power through the angular valving of the waves. The

wave power harnessing device most likely to become utilized first is one designed by Edinburgh University Professor Stephen Salter and is now being supported by the British Government. This technique will harness the rolling motion of the waves; it will consist of a floating rectangular structure of concrete and steel with 20 to 40 vanes over which waves will roll, rotating the vanes which would turn a generator to produce 50 megawatts of electricity. Wave power was chosen as the most promising source of alternative energy for Britain in a recent study by the Central Policy Review Staff.

ADVANTAGES

1. Continuous income energy source.
2. Clean, no by-products, no increase in thermal burden.

DISADVANTAGE

1. Only at a prototype or drawing board stage.

12 Ocean Currents

The ocean currents are an income energy source; they are constantly being regenerated through the revolving of the Earth. Power could be harnessed from them through a series of "underwater windmills."

USES

1. Electric power generation
2. Hydrogen production

ADVANTAGE

1. Plentiful and continuous supply of an income energy source. The Florida Current, a major component of the Gulf Stream, carries more than 50 times the total flow of all the fresh water rivers of the world. Total energy of motion of the current could produce about 25,000 megawatts if all the energy could be harnessed.

DISADVANTAGES

1. Difficulty in harnessing.
2. Only at drawing board stage.

13 Temperature Differential

Temperature differential power is an income energy source. Power can be derived from the thermal gradient that exists between a hot reservoir and a cold reservoir via a Carnot cycle heat engine. Heat will flow spontaneously from a hot region to a cold region. By channeling the flow through a heat engine it is possible to redirect a fraction of the heat energy as useful work. The minimum useful temperature differential is approximately 20° K. Thermal gradients of this magnitude are common in the tropical oceans between the cold, deep waters and the warmer, surface waters. The solar energy impounded in these gradients represents an enormous potential energy supply.

Temperature differential power plants can be built on land where hot and cold ocean currents converge near the coast. Floating power plants capable of operating in deep ocean have also been proposed. Temperature differential power plants could generate either electricity or hydrogen fuel. Another use would be for a power-intensive metallurgical industry which always develops wherever there is cheap electric power.

The technology required to harness these thermal gradients exists. The most serious problems to be solved involve the mooring of a large buoyant structure below water in deep ocean, the stabilization of long under-sea water intake lines, and the transmission of electricity or transport of hydrogen from ocean plants. All of these problems are being or have been dealt with in related contexts.

Other forms of "temperature power" are possible. For example, the temperature differences between the atmosphere and the ocean, mountain tops and warmer valleys, or a flowing river and the atmosphere are all potential energy sources for powering heat pumps.

ADVANTAGES

1. Continuous supply of income energy.
2. Maximum power available in hottest seasons when the demand is greatest.
3. No atmospheric, thermal, or water pollution.
4. Sea-going power plants do not require land area for plant site.
5. Low temperature materials can be used for construction.
6. Fresh water production as a by-product.
7. Mariculture operations utilizing nutrient-rich deep ocean water for seafood production.

DISADVANTAGES

1. Unknown impact on global weather and climactic patterns.
2. Unknown impact on marine environment.

HISTORY

1930: 40 kilowatt land-based power plant built on Cuban coast by French engineer Georges Claude.

1950's: 7 megawatt land-based power plant built by a French corporation, Energie Electrique de la Cote d'Ivoire, at Abidjan.

1971: Project Sea Grant, St. Croix, Virgin Islands. Mariculture plant in operation; fresh water production and power generation projects are planned.

14 Solar Terrestrial

15 Solar Extraterrestrial

Radiation from the sun is Earth's main income energy. The sun is a thermonuclear reaction taking place 93 million miles away whose energy products are received free of charge on Earth. A fraction of this solar radiation is impounded in physical and chemical processes occurring naturally in Earth's atmosphere, hydrosphere, and biosphere. Humanity's technological capability for collecting, impounding, and converting solar radiation is currently at a level of feasibility whereby small scale solar collectors and concentrators have been prototyped, and direct conversion of solar to electrical energy in orbiting satellite collectors, transmitted to Earth receivers by microwave, is expected to be ready for full-scale demonstration by 1985. Present day technology exists for using solar power for electric power generation, direct space heating and cooling, agricultural drying, refrigeration, distillation, and as a furnace for some industrial processes.

Terrestrial systems generally consist of flat plate or concentrating collectors which transfer solar heat to a carrying medium, usually a liquid such as water. The impounded heat is available for immediate conversion to work, to other

forms, or for storage in large containers of the carrier or by transfer of the heat to a physical-state storage medium such as eutectic salts, or dense material such as rock.

Earth-based collectors are subject to the intermittent nature of the solar cycle, and to interruptions by local weather. These can be balanced by large storage capacity or by supplementary energy sources such as wind or methane extraction from refuse. While efficiency of conversion at the collector is 90%, efficiency of the whole system is a function of local variables. The size range for servicing a single dwelling would be on the order of 100 square feet to 1600 square feet of collector surface area. Large solar "farms," arrays of collectors, have been proposed and appear to be technically feasible, although long-term maintenance costs and the cost of electrical conversion and transmission are negative factors at this time. Concentrated high temperature collectors seem most adaptable to industrial uses where conversion to electricity is not required.

Orbital collectors, using direct photovoltaic conversion of solar radiation to electricity, promise low long-term costs because of the relatively benign environment of space, free of physical and chemical erosion. The technology of photovoltaic conversion, microwave transmission and focusing, and microwave collection and conversion has been shown to have high potential efficiency. Technical development of the component parts promises to reach full prototype readiness at about the same time the space shuttle is expected to be available for space installations at acceptable costs, around 1985. Present technological limits indicate a ground receiving station at least 5 miles square, and a transmitting antenna of about 1 mile in diameter. The collector array can be orbited so as to stay in full solar exposure, and collection area can be increased, for increased production of electricity, without increasing the size of either the transmitter or the collector. Microwave transmission will probably be in the 10 cm wavelength, and kept to a density of .01 w/square cm or less at the receiver to avoid damage to living tissue exposed to it.

ADVANTAGES

1. Clean source of inexhaustable energy.
2. Earth thermal burden is not increased from terrestrial conversion of solar energy.
3. Solar power plants are relatively easy and quick to construct.
4. Safe.
5. Sufficient

"Solar power in general has several unique implications which do not arise from its obvious advantages. For example, it could help to redress the severe energy imbalance between temperate and tropical zones; its diffuseness is a spur to decentralization and increased self-sufficiency of population; and as the least sophisticated major energy technology it could greatly reduce world tensions resulting from uneven distribution of fuels and from limited transfer of technology."

DISADVANTAGES

1. Earth-based solar converters work only when the sun is shining; i.e., intermittent, low intensity.
2. Ex-terr. solar increases heat burden of biosphere.

HISTORY

BC-present:	Solar heat for distillation of liquids and drying agricultural products.
1913:	Solar powered electrical plants in Egypt.
1960-present:	Use of solar water heaters in Florida (25,000 dating from the 1920's and still working); Japan (400,000); Israel, and Australia for individual homes. At the end of 1959, completion of plant in Abidjan, France, for thermal conversion of ocean water, with capacity of 7000 kilowatts (thermal).
1967-present:	Japanese use of silicon solar cells for isolated radio repeater stations. 170 sets have been installed with 4000 watts of power.
1968-present:	France (Pyrenees Mountains); large scale mirrored solar oven built for the scientific study of solar energy - produces over one megawatt of power per day, and reaches temperatures of 6000 degrees Fahrenheit.
1971-1972:	Arizona (University of); studies conducted by Meinel indicate tentative feasibility of mass solar energy conversion.
1972:	New York; proposal for a Solar Energy Development Decade.
1974:	Breakthrough in the mass production of photovoltaic cells.

16 Nuclear Fusion

Nuclear fusion is a capital energy source, but one of such vast potential as to render the distinction between income and capital energy sources nonfunctional. The source of power is the energy released when two light atomic nuclei fuse to form a single heavier nucleus. Fusion reactions can only be sustained at extremely high temperatures and pressures. For example, the deuterium-tritium reaction will only produce more energy than is required to initiate it if temperatures of 50 million K° can be achieved. The principle problem encountered in fusion reactions is that of containment, since matter cannot exist as a solid at such temperatures. Two approaches are being examined. The older approach utilizes intense magnetic field configurations to form a magnetic "bottle" in which the reaction is contained.

A more recent approach has been termed inertial containment. In this scheme, a pellet of fuel is heated by a pulse of intense laser light which vaporizes the pellet. A plasma (an ion gas) is formed. The rate of expansion of the plasma is limited by Newton's Law of Inertia (about 10^6 meters per second). If the plasma can be made hot enough by the laser beam before it becomes too diffuse, the reaction will yield significant amounts of energy.

Experiments with fusion have so far not reached the break-even point (the point at which the reaction produces more energy than is required to initiate it). However, recent work indicates that controlled fusion may be attainable with magnetic containment systems, possibly by 1980. Laser fusion may be feasible even sooner.

Several fusion reactions are known. The deuterium-tritium fuel cycle has been considered particularly attractive because it has the lowest ignition temperature known. Deuterium is a common isotope of hydrogen present in seawater. Tritium is a rare radioactive isotope of hydrogen. However, it can be bred inside a fusion reactor from lithium. Estimated reserves of lithium are sufficient to supply energy needs for millions of years. A deuterium-deuterium reaction is also possible. Deuterium could fuel the earth's energy needs for billions of years.

Fusion, like fission, produces significant amounts of radioactive wastes and by-products. For the fusion reactor, the primary problem will be the loss of tritium. Tritium is not only volatile, but tends to diffuse through high-temperature metal walls. When combined with oxygen as water, tritium readily enters living systems. Long-lived radioactive wastes associated with a fusion power economy would be significantly less than that associated with a fission power economy; the magnitude of the problem would depend strongly on the structural materials used in constructing the reactor. In the event of an accident, the radioactive inventory of a fusion reactor represents a biological hazard potential that is at least three orders of magnitude lower than in a fission reactor. Fusion reactors are inherently incapable of a "runaway" accident. No critical mass is required for fusion. The fusioning plasma is so tenuous that there is never enough fuel present at any one time to support a nuclear excursion.

USES

1. Generation of electricity
2. Hydrogen generation
3. As a fusion torch for the refinement and/or recycling of raw materials

ADVANTAGES

1. Large fuel supply.
2. Long-lived radioactive wastes are significantly less than with a fission based economy.
3. Very low accident risk.
4. Fuel reprocessing accomplished at reactor site.
5. Fusion fuel requires no combustion of the Earth's oxygen.
6. There are no air emissions such as carbon dioxide or other combustion by-products.
7. The ultra-high density plasma from the exhaust of a fusion reactor can be used to disassociate and ionize any solid or liquid material — a fusion torch — for recycling resources.

DISADVANTAGES

1. Not technically feasible at present.
2. Potentially significant amounts of tritium leakage.
3. Potentially significant amounts of thermal pollution.

HISTORY

1932:	Fusion first experimentally reproduced in particle acceleration experiments.
1952:	Explosion of first fusion bomb.
1951-present:	Development of magnetic containment systems.
1961:	Laser action first demonstrated.
1968:	Fusion reactions first initiated by interaction of laser light and a plasma.

17 Gravity

Gravity is an income energy source; it compares in magnitude with the sun as a potential power source. In fact, gravity is the most abundant source of energy in the Universe. Gravitational waves (gravitational fields propagating at the speed of light) resemble electromagnetic waves in that they carry energy, momentum, and information. Electromagnetic waves interact only with electric charges and currents; gravitational waves interact with all forms of matter/energy. Recent discoveries by Weber seem to indicate the galactic center radiates an amount of energy which corresponds to the energy of 1000 suns per year or more. This is about 10,000 times greater than all the light and radio waves emitted from the direction of the galactic center.

HISTORY

1911: Einstein's General Theory of Relativity predicts gravity waves.
1969: Weber detects gravity waves.

ADVANTAGES

1. Greatest source of energy known to humanity.
2. An income energy source.

DISADVANTAGE

1. Presently unharnessable.

18 Electrostatic Energy

Electrostatic energy is an income energy source which taps the Earth's electric field. Electrostatic induction is a means of charging certain properties with an electrical force. The natural repulsion of similar charges (negative/negative or positive/positive) produces forces of considerable magnitude where the electrons become concentrated and are actually discharged from the conductor. There are three types of electrostatic motors currently being studied — spark, corona discharge, and electret. Large electrostatic motors can be operated from the Earth's electric field, provided that appropriate aerials are used. Power for these motors can also be transmitted through the air direct without wires. On a clear day, the air above one square mile of the Earth's surface contains about 3 kilowatts of electric energy. During electric storms, however, the air above one square mile can contain up to 10^9 kilowatts of electric energy. At the present time, this energy in the form of electric currents flows from the air into the Earth and from cloud to cloud. The power dissipated by these currents is estimated to be between one million to one billion kilowatts. It is presently unknown what percentage of this energy can be converted into useful work and how fast the Earth's field would replenish itself once part of the energy has been extracted from it.

19 Hydrogen

Hydrogen, the simplest, lightest, and most abundant of the 92 regenerative elements in the universe, could be classed as an "income" energy source, in that we will never run out of it as it is a material which recycles in a relatively short time. It can be made from water, so the potential supply is theoretically endless. Hydrogen has indirectly and invisibly functioned as humanity's energy source throughout history through hydrogen fusion reactions in the sun and in carbon-hydrogen combinations of petroleum and natural gas. Hydrogen can be used as a combustible fuel for transportation, space heating, electric power generation, or industrial processes. It can be used as a material in industry for such things as the hydrogenation of fats, oils, margarine, and soap; the production of ammonia for fertilizers, and metal powders annealing stainless steel methanol; inflation of weather and other types of balloons; cooling electric generators; and the synthesis of chemicals for nylon, polyurethane, and glass. It can also be converted directly to electricity in a fuel cell. It is an exceptional way of storing intermittent energy sources; e.g., solar radiation and wind. Hydrogen enjoys other advantages in efficiency and application over its fossil fuel counterparts, not only conventionally-vented, flametype appliances readily adaptable to hydrogen, but ventless, flametype combusters are also possible. As much as 40% of the combustion energy is vented to the exhaust vent in conventional burners. Non-vented hydrogen furnaces, on the other hand, can deliver all the combusted energy to the heated space. (Hydrogen combustion yields no toxic substances — just heat and water.) Condensation and collection of exhaust water can provide humidity control. Also, even higher efficiency flameless catalytic heating devices can be utilized for space and process heaters. When a hydrogen/air mixture is passed over the catalytic surface, flameless combustion takes place. Heating devices operating on this concept can be formed into wall panels for space heating or horizontal surfaces and shapes for process heating and cooking. It may soon prove more economical even with present day accounting perspectives for industry in high density urban areas to convert to hydrogen than to install and operate air pollution control equipment mandated for fossil fuel use.

Hydrogen Production

Currently, hydrogen can be produced by four methods: electrolysis, thermochemical watersplitting, photolysis, and algae photosynthesis.

Electrolysis is the most widely known and presently the most convenient technique of hydrogen production. By passing a current through an electrolytic solution such as water, hydrogen and oxygen ions gather at opposite electrodes. Both the hydrogen and the oxygen can be tapped and stored. Presently,

conversion efficiencies of electrical energy/hydrogen production are 60% to 75%. In the near future, electrolytic production efficiencies of 95% are expected.

Thermo/chemical splitting of water through a multistep process where chemical disassociations and associations under high temperatures (25° C to 925° C) change the valences of the closed system recycling chemistries and decompose water into hydrogen and oxygen. Thermochemical water splitting is presently an experimental process but with new technological developments in primary energy source conversion to heat, it appears to have great competitive potential with the conventional electrolytic (electrical energy to hydrogen production) conversion. The advantage of thermochemical water splitting is the direct utilization of heat to produce hydrogen, thereby avoiding the intermediate steps of electrical energy generation.

Photolysis is a means of breaking molecular bonds with incident light photons. Water can be composed directly by light with a photocatalyst which absorbs the visible light to break water bonds. This process occurs naturally in the upper atmosphere, yet its direct applications by man at this point, under controlled conditions, do not demonstrate any promising conversion efficiencies.

Algae-photosynthesis, photosynthetic production of hydrogen using algae and bacteria to decompose water, are now being studied. Recent research promises that this technique may be able to produce sufficient hydrogen to meet the energy needs of the entire planet. Depending on our ability to systematically control these photosynthetic processes, algae could become a major source of hydrogen production.

Hydrogen Storage and Transport

Hydrogen can be stored in three physical states: gas, liquid, and solid (absorbed in metals such as lithium, palladum, and magnesium) and is readily accessible for use in all three states.

Gaseous Hydrogen

Hydrogen, by most techniques, is produced as a gas. This gas can be compressed and stored, yet the volumes and pressures make it feasible only as a process in a centralized system. Hydrogen gas can be released from a compressed state to low pressures and be utilized in ways similar to that of natural gas by means of pipelines.

Liquid Hydrogen

Cryogenic (low temperature) technology as a spin-off of the space program has developed sufficiently to show that liquid hydrogen be seriously considered as a form of hydrogen storage. The liquid hydrogen rocket turbines which successfully propelled astronauts into moon orbit was supported by a cryogenic technology able to produce, transport, and store liquid hydrogen at temperatures of 423° Fahrenheit below zero. Pipelines, tanks, and transport trucks have all been developed for liquid hydrogen.

Hydrogen in a Solid State

Storage of hydrogen in metal and intermetal hydrides promises to be an effective alternative to gas and liquid storage, avoiding the problems of gas compression and low temperatures. "Because of its small molecular size and high diffusivity, gaseous hydrogen is able to penetrate the lattice structure of solid metals or alloys and bind at various sites in the unit cell of the crystal. For many metals, such as titanium, the penetration is so great that the concentration of hydrogen per unit volume is actually greater than in liquid hydrogen. The hydrides are formed by simply exposing the metal to pressurized hydrogen. Hydride formation is exothermic and can be reversed by the application of heat; waste heat from the combustion process can thus be used to free the hydrogen."

One use of hydrogen storage in a solid and liquid form would be in a land surface transport vehicle (automobile or truck) where hydrogen could be stored in liquid form in a small cryogenic tank and the boil-off gas (a problem with small cryogenic tanks is the inefficient surface to volume ratio and consequent boil-off) could be absorbed in a small metal hydride tank and released for combustion in the engine.

ADVANTAGES

1. Most abundant fuel source.
2. Little or no air pollution, H_2 combustion yields H_2O and heat.
3. Existing energy converters can readily switch to hydrogen.

DISADVANTAGES

1. Production of hydrogen is presently not as inexpensive as petroleum and coal mining.
2. Hydrogen has a low energy density on a volume basis; this prevents storage of sufficient quantities onboard some land vehicles to give a long range of operation.

20 Water Salination

Water salination is a potential income energy source; it is a naturally occurring geophysical energy flux from which energy can be extracted through the mixing of fresh water and sea water. This process can best be illustrated by considering the reverse process – energy is required to extract fresh water from sea water. The reversal of any desalination process will release energy. A fresh water flow of one cubic meter per second could provide 2.24 megawatts of power. Total power available from water salination is comparable to hydroelectric power in magnitude. The energy flux available for natural salination is equivalent to each river in the world ending at its mouth in a waterfall 225 meters (738 feet) high. A salination power plant using only 10% of the flow of the Mississippi at an overall efficiency would deliver 1000 megawatts of power. The salination energy is readily converted to mechanical or electrical energy. One scheme for this is given in the following illustration.

ADVANTAGES

1. Non-depletable and clean energy source.
2. Large magnitudes of energy available.

DISADVANTAGES

1. Only at theoretical stage.
2. Potentially ecologically disruptive as hydroelectric power plant.

21 Osmotic Pumps

Power from an osmotic pump source would be an income energy source. Power is derived by fresh water rising through a pipe sunk deep into the ocean. The pipe is inserted into the ocean below a depth of 8750 meters, a semipermeable membrane at the bottom end lets water pass but excludes salts. The fresh water inside the pipe then rises until its weight equals the osmotic force across the membrane. Because fresh water is lighter than salt water, it is thus forced up the pipe with considerable force – enough to drive a turbine to generate power.

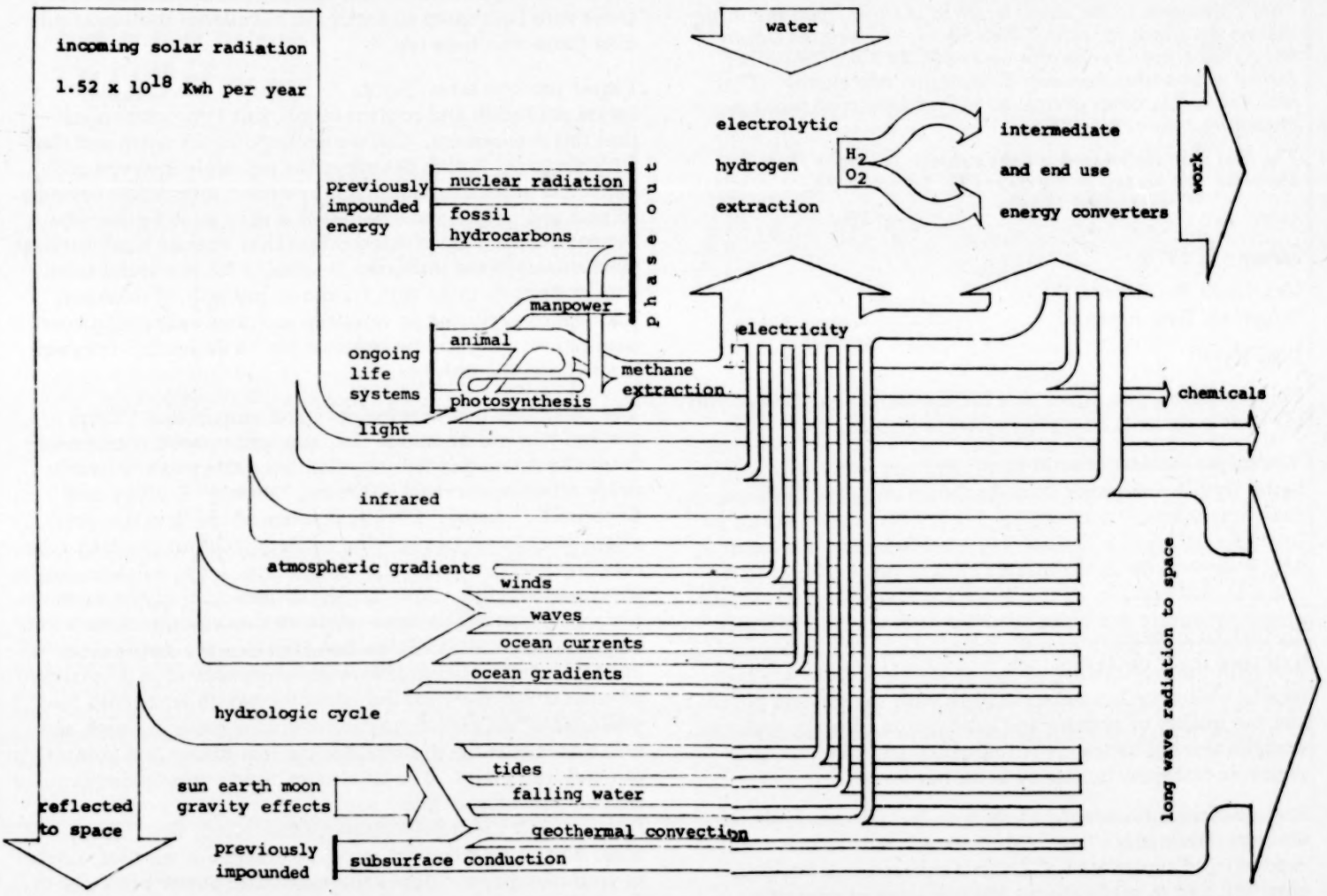
ADVANTAGE

1. Clean and vast source of energy and fresh water available.

DISADVANTAGES

1. Just at theoretical and preliminary drawing board stage.
2. Unknown impacts on ecology. ●

Strategy of switchover to conversion of many sources of energy, with hydrogen as the storage medium.



HYDROGEN SYSTEM

Because the income energy of decentralized and centralized tidal, solar, and wind sources are inherently intermittent and vary in intensity by location and time, an energy carrier which stores the income energy (much the way fossil fuels store energy) and provides a transportable medium (much the way the electrical transmission network functions) is highly desirable. One such currently available means of storing and transporting the various sources of income energy is hydrogen. Hydrogen can be produced from the scale of a single dwelling unit's wind powered generator to a regional scale solar-farm powered hydrogen production plant. Off-peak hours at large scale centralized geothermal, tidal, and hydroelectric power plants can also be utilized for hydrogen production.

The energy strategy calls for the immediate development of a global hydrogen storage and transport network, developed much along the lines of the current electrical distribution network. Currently existing pipelines for natural gas and oil can be used for hydrogen transport with little or no modifications. Many present day natural gas and liquid fuel transport carriers, industrial processes, and residential appliances can be converted to use hydrogen. The development of such processes as the hydrogen reduction of iron ore and the development of petrochemical processes based on hydrogen, carbon, and carbon dioxide would further aid in the total elimination of fossil fuel consumption. It has further been estimated that even a fivefold increase in the total global energy system would result in lower releases of pollutants in the environment in 2020 A.D. than the amounts released in 1969, if the energy system utilized the synthetic fuels of hydrogen, alcohol, and methane instead of fossil fuels. ■

Reply to "Energetics' Shortcomings"

This letter responds to Hazel Henderson's epistle in the Winter CQ *responding with affectionate criticism to her experience at an energetics symposium with Howard Odum. (If you haven't read Odum's dazzling article, "Energy, Ecology & Economics," EPILOG pp. 469-473, all of this will be Greek.)*

The responder is Tom Robertson, coordinator of the Energy Center at the University of Florida, Gainesville. An unnamed shy lady, presumably in Florida, adds a postscript.

Tom comments in his cover letter to us, "I dodged the information questions for now." Well he might. Neither Odum nor Bateson nor anyone else we know has a handle on the formal relationship between information and energy. That lack has hampered or destroyed the usefulness of many a modelling methodology.

The best man we've seen on the subject, biologist Ramon Margalef, has his say in the next CQ, *Summer '75.*

— SB

January 8, 1975

Mrs. Hazel Henderson
Princeton, New Jersey

Dear Hazel:

Enjoyed having you down here for the workshop. Thank you for your comments on energy systems analysis.

You might consider general energy systems analysis as a better term for the work done by Odum and his colleagues than simply energy accounting. Energy accounting seems to imply too much of a similarity to traditional accounting in which we total up all the assets rigidly defined by money on one side, and total up all the deficits again defined by money on the other side and make some assessments as to whether we are making a profit or not. Energy accounting then would deal with the profitability of one or several entities whereas general energy systems analysis deals with the survival potential and quality of systems and sub-systems. Energy systems analysis also lets us track environmental and other costs which do not show up clearly in money flows.

In your second comment you seem to be concerned, (1) that we were developing a new "Cosmology," and (2) that the espousal and exploration of Lotka's maximum power principal will lead to social abuses and delusions of scientific grandeur. A cosmology – the putting together of everything in one statement – seems to arouse a combative caution in many people. This is understandable in view of some of the garbage of past cosmologies (and the lack of humility which is essential to the makeup of anyone who can posit a cosmology). But can we let past failures bar the door to all further attempts at synthesis? Einstein's E equals Mc^2 implies a cosmology that is usable by man; so there is a start. What we do with it is something else. If everything is connected to everything, as we increasingly find it is, the implication is that real meaning can only be derived from looking at everything – an admitted impossibility. A cosmology then, can be a device for putting "everything" into a simple but inclusive statement. From this statement, which we use as a base for future explorations, we can pursue understanding and dare to have some new thoughts which may prove to have value as social tools for survival. Any idea which deals with the wholeness of the universe and life must approach a cosmology, and if that really is a dirty word, then so be it.

The Lotka, or maximum power principle, is a statement about an observed behavior found in hundreds of general energy systems models. While this principle may be an excellent eye around which to wrap an academic hurricane, I would prefer to see it otherwise. We are all concerned with the survival of the society within which we live. We cannot afford to ignore any hard won insights which could assist in our understanding the processes about us, boost our survival odds, or even just enhance the quality of that survival. Darwin, Lotka, and Odum didn't invent the principle you view with such alarm. They have only been instrumental in pointing out its application to those interested in understanding the processes and priorities at work in the systems that cradle our lives. What they describe has only been recognized. Dionysius said: "It is a law of nature common to all mankind, which no time shall annul or destroy, that those who have more strength and excellence shall bear rule over those who have less."

I agree that the term "Lotka Principle" is one that may create confusion and confrontation, but I do not concede that this is necessary. Can we get beyond the word and deal with meaning. Lotka described the principle in terms of biological processes; Odum has extended it to whole systems of man and nature and is asking if it may serve to describe the complicated set of interactions that operate in all survival mechanisms in the universe. It remains for the social scientists to do their thing with it, and to my way of thinking that means exploring its validities and then examining how man can work within its confines for "a better fit" between himself and the universe.

The maximum power principle states simply that "those systems win and dominate that maximize useful total power from all sources and flexibly distribute this power towards needs affecting survivial." (Odum, "Energy, Ecology and Economics," Ambio, 1973). It seems to me that this principle states rather neatly what appears to be an ironclad rule for perpetuation of just about anything – a population, an idea, even an ethic. If so has the authenticity of the maximum power principle been validated through the observation of practically everything we can discern and comprehend? I am not so interested in theoretical argument as in discussion of what is necessary for industrial society to withstand the pressures of the transformation it is now going through and will continue to go through, for the rest of our and at least our children's lives. The maximum power principle says that we must tap as many sources of energy as possible and that we must use those energies in the wisest way manageable. Not to do so would seriously affect our survival. Look at your newspaper. Apply the maximum power principle to any policy you see outlined. Are the people involved using all the energies available to them? Is the net energy from the sources available to those consistent with their needs and wants? These questions and many others are not being asked, much less answered. If a principle can affect my survival I will use it until it's replaced or effectively discredited. Again, what and where are our alternatives?

Your third comment, could easily have been answered if we'd had the time during our workshop to show how a number of the general energy systems processes, as applied by Odum and others, work, particularly in the development of these programs and their application. As I'm sure you heard a number of times during the workshop, "to understand any system you must look at it from at least the next larger system." This is an inherent part of any energy systems inquiry and Odum and his colleagues are careful always to meet this requirement.

You comment on the study of cooling towers – their relative efficiency compared to using an estuary for receiving waste heated water, and ask whether as an alternative the power plant should have been built in the first place. I appreciate the larger scale of your question, and I can assure you that the considerations you speak of were considered in the evolution of that research project. Because of competition consistent with the maximum power principle, and the

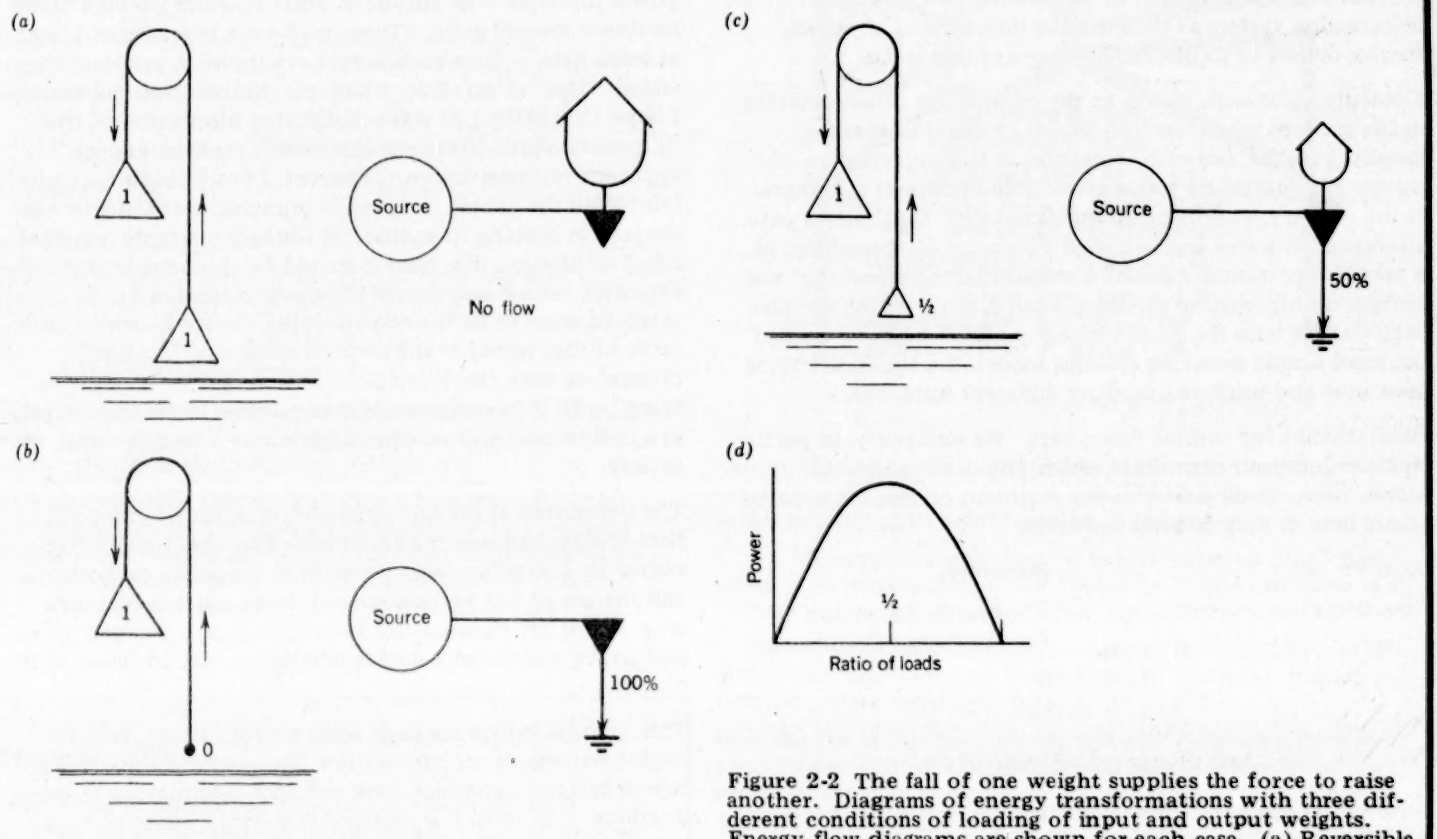


Figure 2-2 The fall of one weight supplies the force to raise another. Diagrams of energy transformations with three different conditions of loading of input and output weights. Energy flow diagrams are shown for each case. (a) Reversible stall; backforce and input force equal; no flow, no power delivery to new storage, the reversible case. If it moved it would be 100% efficient. (b) Free drop; no backforce; maximum flow rate, no power delivery to new storage, no provision for delivering load-lifting work. (c) Maximum power storage rate; backforce loaded to be half of input force; moderate flow rate, maximum power delivery to new storage, half of energy dispersed to heat sink. (d) Graph of power and load.

From **Environment, Power, and Society**, *Howard T. Odum, 1971. (CATALOG p. 8)*

DARWIN-LOTKA ENERGY LAW

Thus, whenever it is necessary to transform and restore the greatest amount of energy at the fastest possible rate, 50 percent of it must go into the drain. Nature and man both have energy storages as part of their operations and when power storage is important, it is maximized by adjusting loads, as demonstrated in Figure 2-2(b). In the last century Darwin popularized the concept of *natural selection,* and early in this century Lotka indicated that the maximization of power for useful purposes was the criterion for natural selection. Darwin's evolutionary law thus developed into a general energy law.

realities of the times in which these projects were undertaken, if the power plant under question had not been built by the corporation which constructed it a competitor would have proposed and built equal capacity in some other part of the system. It's unfortunate that regional, national, and global systems understanding was not underway and available to our policy makers years ago. Had government and utilities policy-makers had these tools, they might have done something more useful than simply to react to what they perceived as external influences. Many of the problems of finance, economics and the environment which are bombarding our utilities could have been anticipated, in fact, more were. See M. KING HUBBERT, Adm. Hyman Rickover, and even late 1800's sociological William Graham Sumner.

The research using the tool of general systems analysis can only describe the system and the cost of the alternatives. Add-on pollution control equipment would be seen as possibly clearing up pollution in the area of the former polluter; however, energy systems modeling requires also that we add in the energy costs of manufacturing the pollution control equipment, and how much pollution occurred in some other part of the system as a result of the manufacture of that equipment?

These costs must be figured in terms of used resources, reduced efficiency, and probably most important, the delayed asking of the basic question: Why do we do what we do?

Understanding and effective policies can only emerge from perception that includes the larger system. In comment No. 5 you deal with the problems in converting dollars into kilocalories and vice versa. We are aware of this problem and have stated it many times, in workshops here and elsewhere. We are finding, however, that large aggregate systems have a complexity of energy inputs and a variety of activities which affect energy quality. In these cases, average dollar-kilocalorie ratios can be applied with qualifications. The numbers are used only to gain some insights in lieu of none.

Subsequent experience with these numbers in a large set of circumstances has allowed us to ask questions which we hear coming from few other quarters and if only because of their contrast with established policy and thought they raise important subjects for consideration. As you know our economic system is an information system for the moving around and trading of resources. (I might inject that our current global problems in economics are not so much related to questions of inflation and other symptoms of drastically readjusting energy conditions, but are more reflections of a deteriorating quality of information on which our economic system is based.) Inflation causes problems of itself. Probably the most serious problems will

come from the uncertainty and lack of confidence which plagues the flow managers of this tremendous economic information system as they use the interactions of marks, franks, dollars to juggle the resources of this globe.

I heartily agree with you as to the complexity of information in the systems where we live. Some new and interesting insights into the role of information in this organization of energy and matter are being investigated here and elsewhere in the country, as you mentioned yourself. I appreciate your interest in this area and will send you more on the subject as it takes on presentable form. I would like to suggest that the process of information directing energy is one which we have been dealing with for quite awhile, and is an inherent part of the most simple surviving systems model, the equation having been used and validated in many different instances.

Hazel, thanks for coming down here. We enjoyed your participation and your comments which I have attempted to answer here. I will send you the pertinent comments of some others here as they become available.

Sincerely,

Thomas A. Robertson
Energy Center Coordinator

ANONYMOUS POSTSCRIPT

Systems are more than the scientific figures developed in the models and studies, and therein lies one of the main reasons that most systems predictions – from Malthus to Meadows – turn out to be wrong, at least by a large time element. Social scientists who understand both physics and systems modeling in respectable depth, are desperately needed as synthesizers of their own knowledge (of how human social systems work) with that knowledge contained in physics and systems dynamics. Further, their talents are sorely needed when it comes to formulating the recommendations based on systems modeling studies and beyond that, in the designing of methods for implementation. This is where the social scientists could be most effective – as amplifiers of the energy that is implicit in the synthesis of their information with that provided by physics and systems dynamics.

I was reading an ancient (1916) work of Henry Adams the other day – the last chapter of a book titled **The Degradation of the Democratic Dogma**, yet! In a chapter titled "The Rule of Phase Applied to History," he posits the idea that the human mind can take two (at least) pathways toward knowledge/enlightenment; the paths of science and religion. But in any case, he argues, what the mind discovers as it travels either path, is itself, reflected. In the recent writings of John Archibald Wheeler ("The Universe As Home for Man") it is strongly suggested that the two paths are converging – that physics and metaphysics, of the universe and of the mind, are in the process of a synthesis of their own.

Obviously, there must be another energy conference. It might well begin by separating those who are mainly interested in what is in the "black box" from those who are concerned primarily with what the black box can do. Then the ethics-oriented could have the input they should command in a discussion whose depth and range is so profound. It's in the sadly lagging area of the social sciences that the actual energy of ethics and its possible function in "real world" terms could be pursued. (When I say "its possible function" I meant "its potential" in a measurement sense, not in the sense of whether or not it exists.)

In a way I have to agree with you about the possible misuses of "Social Lotkaism." I heard Gordon Liddy on 60 Minutes Sunday night and it was a distressing reminder of how far some people are willing to carry a principle – especially a power principle – in pursuit of what you and I would agree no doubt are evil ends. (There may even be a hint of Lotka at work here – since such people are traveling without the added "drag" of an ethic, which maximized their net energy. I hope I'm joking.) It was a distressing illustration of the "I'm-sorry-about-Nixon;-he-just-wasn't-ruthless-enough" approach to social action. However, I don't think it's quite fair to ask the people involved in pursuing energetics to take the lead in curbing its misuse. If Lotka's principle is indeed a fact of physical life, then it should be thoroughly researched, explored, tested, and carried wherever it can take us as a tool. It would seem to be the responsibility (in the Garrett Hardin sense of that word) of the social scientists to familiarize themselves with the Principle and then to "do their own thing" with it to ensure insofar as possible its circumscription as a destructive, and its promulgation as a creative tool in society.

The initial step, it is fairly apparent, is in the building of firm bridges between the knowledge and new insights furnished by energetics (with or without emphasis on Lotka), and the use of this knowledge and those insights by those who are master-planning our future; including the politicians and policy makers who decide whether or not to listen to the planners.

This, in turn, brings me back again to your letter, with its cogent comments on information, its varying values, and its role in systems dynamics. Few consider information as being anything at all until it is received and comprehended by a mind. However, the problem is largely semantic, and information is everywhere at work in the universe in the sense that it guides the "self-design" (pardon the anthropomorphic prefix) of systems.

Paul Weiss, who seems to have recognized systems dynamics before anyone else of record, speaks of "the patterned structure of the dynamics of the system as a whole" and calls it "the coordinator" of the system's constituent activities. All of which seems to be just another way of describing the "information" (as we conceive it) that is contained within systems.

The Heisenberg principle of uncertainty may be applied with some validity at the everyday (ordinary) scale of human events, so that we began our "predictions" with the understanding knowing something represents an injection of energy into the system that is bound to affect it in profound and largely (so far) unpredictable ways. At this stage of our ability to handle knowledge, it seems to mean that we can only know what would have happened if we hadn't known. We have settled for that at the subatomic level. We may have to settle for it in constantly readjusting ways at the social level too. ■

> "In everything people say I see a kind of mishmash, and I intend to fight like hell to get the concepts sharper than hell."
>
> – *Warren McCulloch*

[sent by Judy Van Slooten]

What energy isn't

Relevant to the comments of Robertson and friend, above, is this note from Gregory Bateson to a potential collaborator in an anthology.

– SB

4 December 1974

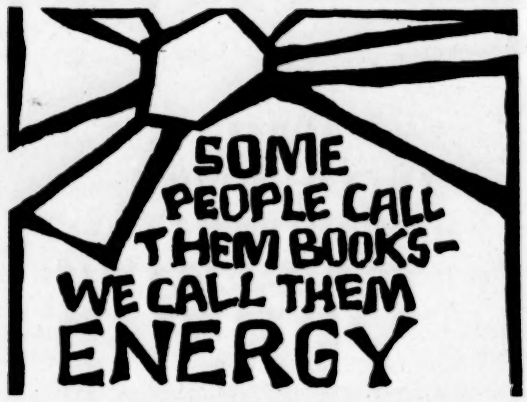
Dear _____

Thank you for your letter of November 16th and for your willingness to write. It is an honor you do me.

You say "energy" and qualify the word by saying that neither you nor anybody knows what it is.

But that (the qualifying comment) is not quite true, because, after all, we (scientists) made up the concept and therefore know (or should know) what we put into it.

What is on the other side of the fence, of course, we do not know. But we made the concept to cover what we thought was "out there" and gave the concept what we thought were appropriate characteristics. These latter we know, because we put them where they are, inside that word "energy."



From an ad in WIN Magazine

I am strongly of opinion that these well-known characteristics are not appropriate to the sort of explanatory principle which psychologists want to make of the concept.

1) "Energy" is a quantity. It is indeed rather like "mass," which is another quantity. Or "velocity." None of these is a "substance" or a "pattern." They are quantities, not numbers.

2) "Energy" is a very tightly defined quantity, having the dimensions ML^2/T^2 (i.e., (mass x length x length) ÷ (time x time), or, more familiarly, mass x velocity^2).

Now the rub is that no quantity can ever generate a pattern, and to assert that this can occur is precisely the entering wedge of the new supernaturalism, for which Freud, Marx and Jung are much to blame. (They "could" have known better.)

Quantity, of course, can and often does develop and intensify latent difference but never creates that difference. Tension may find out the weakest link in the chain but is never the explanation of how that particular link came to be the weakest. (Indeed the characteristic called "being weakest" is not inherent in that link but precisely in the relation between that link and the others. "It" could be "protected" by filing one of the others!)

3) The next step in supernaturalism after the invocation of "energy" is the belief in Lamarckian inheritance and ESP. After that the next step is the assertion that man contains two real existing principles, viz. a Body and a Soul. After that any sort of tyranny and oppression can be rationalized as "good" for the victim.

So, there is a slot in our proposed book for arguments in favor of "energy" as an explanatory principle, but such arguments in that context will necessarily be controversial. I urge you to treat "energy" as a controversial issue, not as a "matter-of-course."

Personally I have never been able to see or feel why this very "mechanical" metaphor ("energy") appeals to especially humanistic psychologists. What are the arguments for this metaphor rather than "entropy" (which is still a sort of quantity)? What characteristics of the original concept (energy or entropy) are to be carried over when the concept is used metaphorically to explain action or (?) anatomy?

Are you familiar with Larry Kubie's paper*, long ago, in which he neatly and (I think) completely exploded the whole Freudian "economics" of energy? It was that paper that earned him his place at the Macy Cybernetic conferences. But he never contributed anything there. I guess they slapped his wrist for heresy.

Finally, believe me that the intensity of passion and care spent upon this letter is a function of both my esteem for you and my hatred of the principles which hide behind the use of "energy" (and "tension," "power," "force," etc., etc.) to explain behavior.

Yours sincerely,

Gregory Bateson
Santa Cruz, California

*"Fallacious Use of Quantitative Concepts in Dynamic Psychology," Psychoanal. Quarterly, 16; 507-518, 1947.

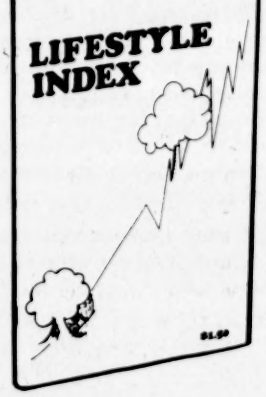
Lifestyle Index

Care to do an energy accounting of your own personal life? With this handy detailed guide it won't take as long as preparing your income tax and will say a great deal more about your real expenses.

An "Energy Unit" in this book is about 10 kilowatt hours — the average American uses 9500/yr, the average Nepalese 8/yr. But you're not average . . .

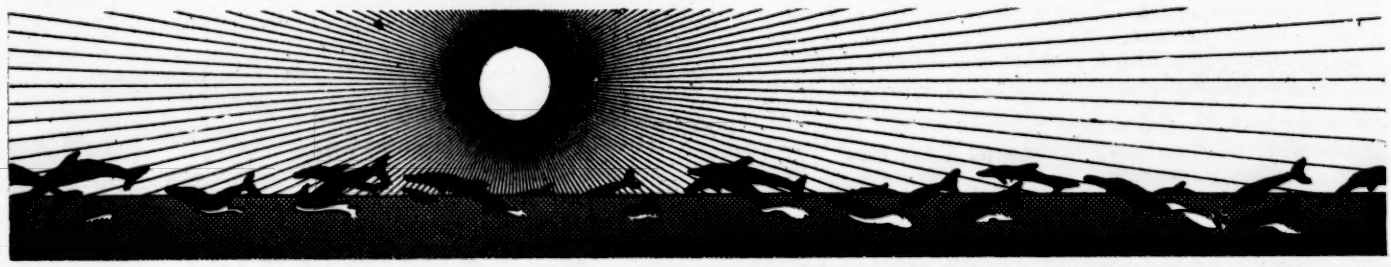
– SB

Lifestyle Index
Albert J. Fritsch and
Barry I. Castleman
1974; 60pp.
$1.50 postpaid
from:
Center for Science in the
Public Interest
1779 Church Street, N.W.
Washington, D.C. 20036



ENERGY UNITS PER CAPITA EXPENDED ANNUALLY IN SELECTED COUNTRIES

Afghanistan	23	Ecuador	263	Jamaica	1068	Phillipines	246
Albania	524	Egypt	241	Japan	2755	Poland	3690
Angola	130	El Salvador	171	Jordan	260	Portugal	685
Argentina	1490	Ethiopia	34	Kenya	145	Puerto Rico	3230
Australia	4600	Finland	3655	Khymer Rep.	20	Saudi Arabia	813
Austria	2890	France	3314	Kuwait	8610	Singapore	1320
Bahamas	4285	Gabon	874	Laos	71	Spain	1406
Barbados	975	Germany	4412	Lebanon	709	Sweden	5140
Bolivia	175	Ghana	157	Liberia	313	Switzerland	3015
Brazil	435	Greece	1240	Madagascar	62	Tanganyika	59
Burma	57	Greenland	3750	Mali	21	Turkey	436
Burundi	9	Guatemala	196	Mexico	1072	Uganda	61
Cameroon	82	Guinea	85	Mozambique	148	United Kingdom	4650
Canada	7870	Haiti	24	Morocco	171	Uruguay	775
Chad	23	Honduras	183	Nepal	8	U.S.A.	9500
Chile	1255	Hong Kong	862	Netherlands	4325	USSR	3825
China	473	Iceland	3640	Nicaragua	324	Venezuela	2107
Colombia	559	India	157	Niger	21	Yemen	11
Congo	212	Indonesia	106	Nigeria	50	Yugoslavia	1360
Costa Rica	378	Iran	865	Norway	4400		
Cuba	949	Ireland	2830	Panama	662	WORLD AVERAGE WITH U.S.	1630 E.U.
Czechoslovakia	5590	Israel	2245	Pakistan	68		
Dahomey	30	Italy	2245	Paraguay	119	WORLD AVERAGE WITHOUT U.S.	1167 E.U.
Denmark	4495	Ivory Coast	238	Peru	519		



Getting Specific for a Porpoise

How and why to save porpoises & dolphins by boycotting certain kinds of tuna ("chunk light" and "light meat").

Eugenia McNaughton is with Project Jonah, Box 479, Bolinas, CA 94924. Jonah, which was started in 1972 with $15,000 from POINT, has produced a quite marvelous book on whales and dolphins, Mind in the Waters *(EPILOG, p. 480).*

– SB

BY EUGENIA MC NAUGHTON

While the rest of the American fishermen fade away into economic oblivion, the American tuna fleet got $132,000,000 for their tuna catch last year (in the can worth over a billion dollars). As American as apple pie, the American appetite for tuna moves those neat little cans off the shelves at a brisk pace.

In the 1950's, the American tuna fleet was dying. Limited to fishing for albacore off the California coast, it could not compete with the labor-intensive Japanese long-line tuna fishing for other more abundant species. Imported tuna was underselling and outselling the American caught fish.

Two technical developments gave new life to the fleet. The invention of nylon webbing and the power block streamlined the cumbersome purse seine net. These large nets, surrounding whole schools of fish, made it possible to increase the volume of the catch without adding to the crew. The fleet could now fish down in the tuna-rich waters off the coast of Central and South America in the eastern tropical Pacific. Within four years, the entire fleet converted from a few bait-boats to larger and larger purse seiners.

The species of tuna found in greatest abundance in these waters is yellowfin tuna. For reasons as yet unknown to cetologists, the largest schools of yellowfin are found swimming under societies of species of porpoise and dolphin. Fishermen as well as marine mammal biologists know this. But they are not interested in why this happens, they simply make good use of it.

It is easy enough to spot groups of porpoise and dolphin. They are mammals and they must come out of the water for air. But their behavior out of the water seems somehow more than coming up for air. They seem to be playing, performing tricks, almost dancing (the original water ballet). One species of porpoise characteristically twirls in the air before diving back into the water. Little is known about wild porpoise and dolphin, though scientists speculate about a strong social structure, perhaps even a history of thousands of years of living together. Studies of captive and dead porpoise and dolphins reveal a highly evolved brain and obvious intelligence, a definite communications system and a friendly disposition.

The day is clear and warm and off in the distance a gathering of spotted porpoise are going through its delightful bag of tricks, diving, leaping, touching, making love. The captain of the huge purse seiner sees them. Quickly two motor launches leave the ship, going off in the direction of the cavorting animals. The terrible noise of the small motors sends the animals into a panic. The boats circle around them, herding them into a roiling, frenzied mob. A skiff, containing one end of the purse seine net, is lowered from the mother ship. The ship begins to move in a circle around the porpoise, dropping the net as goes. When the circle is complete, the purse line is drawn closed at the bottom, trapping fish and mammal in the net. The disoriented porpoise become entangled in the net and drown. Others manage to escape, leaving a fin or fluke behind.

Since the development of this technique, some fifteen years ago, of fishing for yellowfin tuna (called, pardon the pun, fishing on porpoise), hundreds of thousands of porpoise and dolphin have been killed and countless more injured.

In 1972, Congress passed the Marine Mammal Protection Act (MMPA). Special consideration was given to the problematic (!) relationship of the yellowfin tuna fishery and the porpoise and dolphin populations in the eastern tropical Pacific. The industry was given two years to work out ways to reduce the number of mammals killed incidental to its fishery, while government scientists started work on estimating the size of the marine mammal populations. The two years are up, hearings have been held, and the tuna industry was issued a permit to fish and kill for the 1975 season.

Common sense and previous sad experience should tell us that the slaughter of so many animals each year cannot be beneficial to a species. The tuna industry would have us believe that ignorance gives license: since no one knows how many porpoise there are in the yellowfin fishing area, it won't matter if they continue to kill them. We marine mammal lovers would prefer to err on behalf of the porpoise: since no one knows how many porpoise there are, let's stop killing them. Preliminary reports of the results of data taken over the last three or four years indicate that porpoise lovers are not premature in their concern. The porpoises may well be in danger of extinction right now.

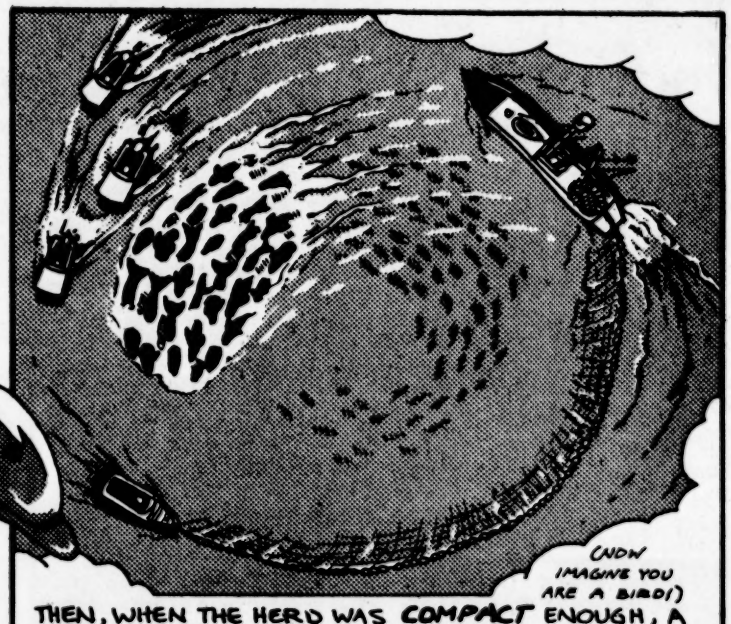
The National Marine Fisheries Service (NMFS) is the branch of the Department of Commerce which oversees commercial fishing and is specifically designated by the MMPA to develop and enforce regulations for the yellowfin tuna fishery that will result in an insignificant porpoise mortaiity rate approaching zero. Thus far, however, the NMFS has been very sympathetic to the tuna industry's position and has been only reluctantly moving to make life aboard the purse seiner any more complicated.

A group of conservation organizations has been speaking for the porpoise and dolphin at the various hearings held concerning the tuna-porpoise problem. This voice has been strong enough to keep the issue alive and has definitely helped to assure the porpoise population research team at NMFS at least a continuance budget. But the government and industry must be told by the people that porpoise and dolphin must not be murdered.

In an everyday money-over-the-counter way, there is no more effective way to make this point than a boycott of the tuna involved in porpoise death. A good percentage of the tuna packed in cans marked "chunk light" or "light meat" tuna is American caught yellowfin fished on porpoise. By refusing to buy this unspecified tuna, you will not be contributing to the slaughter of marine mammals. And if you cannot give up your tuna sandwich, you may buy albacore (a blander, more expensive tuna) or bonita (a stronger tasting, cheaper tuna-like fish). Neither of these fish are caught on porpoise and cans of these fish are labeled as to species.

It would be of further help to write to the canneries (Van Camp and Starkist, both on Terminal Island, Sta. San Pedro, California 90731) and the American Tunaboat Owners Association, 1 Tuna Lane, San Diego, California 92101 to let them know what you are doing and why. They will send you a standard reply protesting their innocence, but at least you will know they received and read your letter. Robert Schoning, Director of the NMFS, Department of Commerce, Washington, D.C. 20235 will also take notice if you write and tell him of the steps you are taking to save the porpoise and dolphin. ■

THE PORPOISES *DIDN'T* PANIC, BUT CONTINUED TO SWIM IN THEIR ORDERLY GROUPS AS THEY WERE HERDED TOGETHER BY THE SPEEDBOATS. BY NOW, THEIR SONAR WAS *USELESS*, THEIR SENSITIVE HEARING PAINFULLY *DROWNED OUT* IN THE BOAT'S HIGH-PITCHED WHINE.

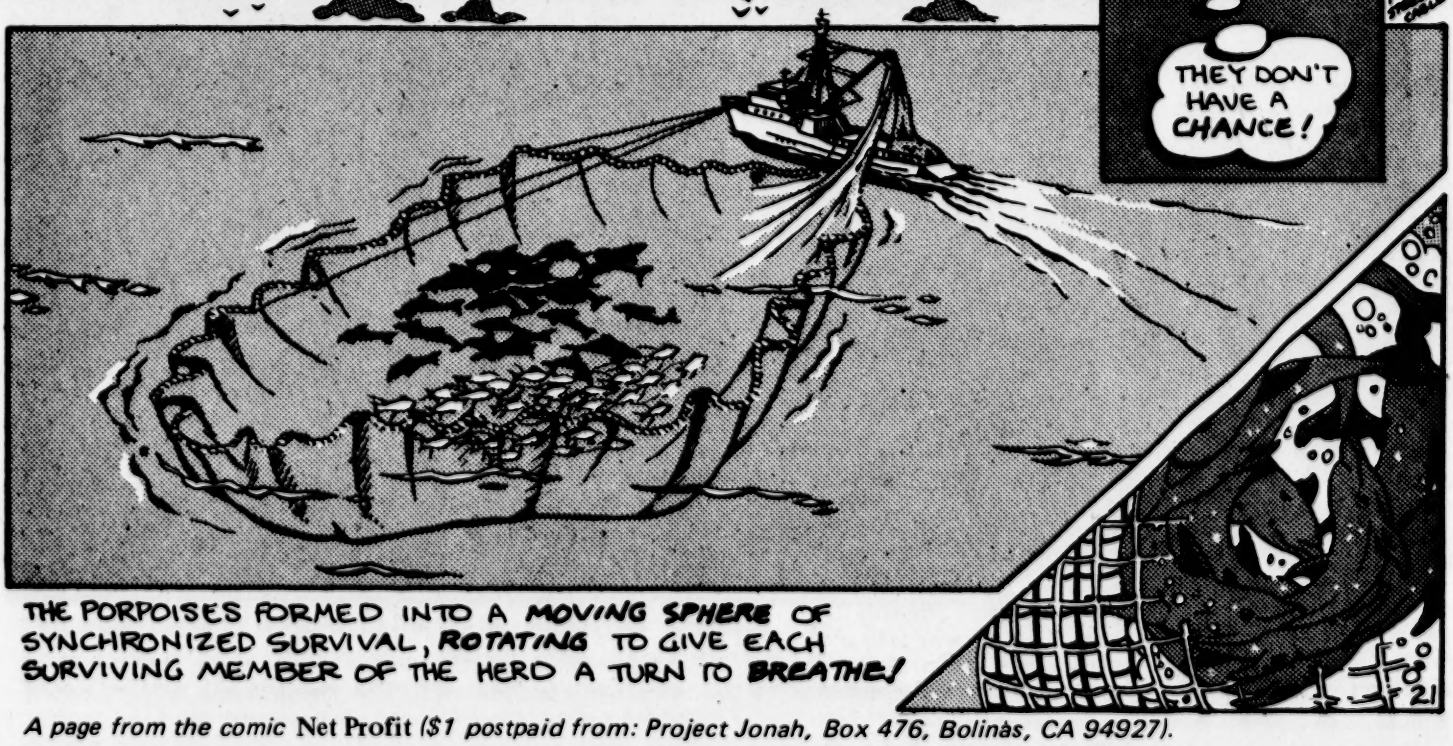


(NOW IMAGINE YOU ARE A BIRD!)

THEN, WHEN THE HERD WAS *COMPACT* ENOUGH, A *SKIFF* WAS DROPPED WHICH CIRCLED AROUND THE PORPOISES AND TUNA TO *SET*...

I WATCHED FROM DECK AS MANY PORPOISES, IN AN *INSTINCTUAL REACTION* TO DANGER, *DOVE* FOR THE BOTTOM TO *ESCAPE*. MANY *DROWNED* AS THEIR SNOUTS OR FLIPPERS WERE *TANGLED* IN THE WEBBING.

LIKE A WELL-DRILLED *ASSAULT FORCE*, THE DEADLY MACHINERY GROUND ON. THE BOTTOM OF THE NET WAS PULLED IN, MAKING A *GIANT SAC*.



THE PORPOISES FORMED INTO A *MOVING SPHERE* OF SYNCHRONIZED SURVIVAL, *ROTATING* TO GIVE EACH SURVIVING MEMBER OF THE HERD A TURN TO *BREATHE!*

A page from the comic Net Profit *($1 postpaid from: Project Jonah, Box 476, Bolinas, CA 94927).*

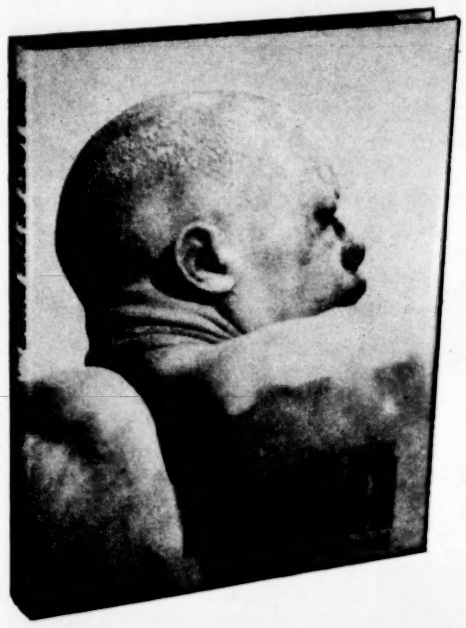
Understanding Whole Systems

The Last of the Nuba

With the impact of Ansel Adams' **This is the American Earth** *or Eliot Porter's* **In Wildness is the Preservation of the World,** *Leni Riefenstahl lovingly reveals what life in balance, a human culture in balance, might feel like. The Nuba is a remote East African tribe. Leni Riefenstahl is the lady who made the films "Triumph of the Will" and "Olympia". The book is almost all color photographs – sensuous, personal, charged.*

How it makes me feel is poverty-stricken.

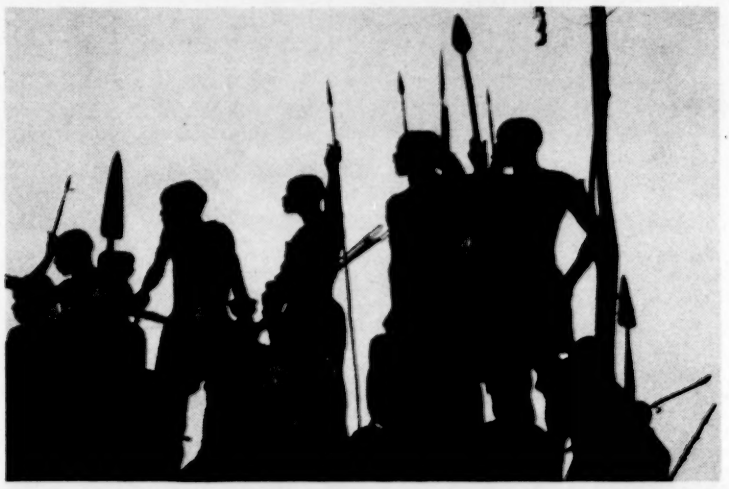
– SB



The Last of the Nuba
Leni Riefenstahl
1973; 208pp.
$18.95
postpaid
from:
Harper & Row, Publishers, Inc.
10 East 53rd Street
New York, NY 10022
or Whole Earth

Generally well in control of their world, the Mesakin Nuba tend to be cheerful and friendly. Young people especially are conscious of and delight in their attractions even though they may, like Tutu, be rather shy. They are fond of ornament, decoration and jewelry and take great care with their appearance.

Fields of tobacco require special preparation: the clay is broken up into separate holes, each of which will take a single plant. This traditional – and immensely ancient – implement is a form of shovel being used here by a young wrestler.



CoEvolution & Darwin

"coadaptation: adaptation of two or more things to each other; mutual adaptation," p. 447, Compact edition, **Oxford English Dictionary**, 1933.

Examples cited from 1803 and 1878. Darwin (1878) p. 20 **Origin of Species**, Signet, $1.25. . . "numerous and beautiful coadaptations which we see throughout nature."

Ta,

Rick Wannall
Freeport, Texas

Is the arms race co-evolutionary?

Simulation Games are sometimes a part of high school and college curricula. In one such game, Inter-Nation Simulation (INS), a group of four students assume the roles of various key government officials; several such countries make up the simulated world. Each nation's power is in the hands of one chief executive, who faces competition from the leader of an opposition party. The rules are structured so that if the incumbent does not allocate enough of his current budget to solve domestic welfare problems (as opposed to spending it all on military power), he is deposed in favor of the opposition man, in an "election" controlled by the game director.

After playing the game a while, i discovered a way to beat the system. The opposition man and i made a deal – both of us would spend all our budget on military power, so that very quickly our nation would become strongest. Each of us was often replaced by election, but since we both followed the same domestic and international policies, implemented by our faithful secretary of state, the government remained solid despite frequent changes in administration. Neither of us could monopolize the power, but by agreeing to share it, we "won" the game (took over the world), primarily because none of the players in the other nations caught on to the trick. They thought we were crazy.

Is this not a good model of the present situation in most Western democracies? Neither party solves the domestic problems while in office, so the people vote in the others, then get more of the same. The only sure winners are defense contractors and military people, whose share of the goodies is always biggest. So just as major corporations collude to fix prices and divide up the markets, so the major political parties alternately share power in a scheme that insures a growing absolute power base ('cause increasing military strength means more arms race, so more world instability, which in turn provokes successively greater threats to national security, which in turn justifies ever greater central governmental power), while each party's share of that power, seeming to fluctuate dramatically from one landslide election to another, remains more-or-less constant over time.

– C. H. Richards
Anacortes, Washington

For a game to be CoEvolutionary it must be long-term self-corrective. So far the Arms Race has been proven uncorrectable by: democracy (as above), totalitarianism, peace, war (short of the mutual annihilator), secrecy, unsecrecy, science, the Space Race, the Third World . . . Maybe there is such a thing as a CoEvolutionary Sink – made of aggression which has grown too symmetrical – into which we will follow the extinct dinosaurs and giant-antlered Irish Elks. – SB

Sky chameleon

More on the "What color is a chameleon on a mirror" question:

Regarding chameleons.

There are lots of them here in Florida's Big Bend area.

They can really jump, leapin lizards!

The chameleon Orisha (god) – Agemo – is an important messenger of the Sky God (Olorun) in the Yoruba Creation Story.

When the female deity Olokun decides she wants the Earth to return totally to what was previously all her domain – all water and sea-marsh – the Sky God, Olorun, outwits her through his chameleon messenger.

Olokun challenges Olorun to a duel of weaving skills at which she is superior. Olorun, as superior Sky God, must accept her challenge or be humiliated.

So he sends Agemo, his chameleon messenger, to Olokun. Agemo tells Olokun that the Sky God will accept her challenge only if her weavings are as beautiful as she claims.

In her vanity, she brings several beautiful weavings to Agemo, and as Agemo looks at each cloth, he turns the same color and pattern – no matter how radiant and intricate they might be.

Olokun thinks to herself that if this lowly god – only a messenger – is capable of immediately duplicating her magnificent weavings . . . then she has no chance against Olorun. Thus she withdraws her challenge and Olorun remains supreme in all things.

– which brings me to those 5' high metallic blue spacemen who landed recently not too far from here in Pascagula, Mississippi. Aren't we a basically blue planet?

– David Grant
Tallahassee, Florida

Ref. for story: **Tales of Yoruba Gods & Heroes**, Harold Courlander.

Kleinform

Dear Stewart,

Read your run on **Birth and Death and Cybernation** in the Epilog (p. 675). Gratifying, of course, to be included; however, I must take exception to your parenthetical description of what I'm working on as "self referencing paradoxes."

Gregory is in the habit of saying klein bottle and not kleinform. This misnaming confuses what it is I'm dealing with. Similarly, to gloss the work with the term paradox is a misunderstanding that can only lead to more confusion.

Let me try to run it down in terms of the figure included in this letter. It is, I think, the final useful figure.

You can, of course, in your mind, classify the parts of the figure according to the theory of logical types and thereby declare the form paradoxical. But that declaration is only a function of your belief in the necessity of paradox. It is not a valid function of the differentiation described and supported by the figure given. In considering the figure it is position that matters, not classification. Different positions make for different relationships. Classification is superfluous. Thereby, paradox is evaded thru adherence to a calculus of intention.

I sent Gregory a lenthy explanation of this business in reply to a letter of his. I hope, if you have the chance, you would look at the correspondence.

If you can demonstrate to me that the given figure is a "self referencing paradox" I would be delighted to drop the whole business and go back to dealing with noise raw or pack it in. In lieu of such demonstration, I need cherish the hypothesis. Part of that cherishing is to ask you to drop the description given in the epilog.

Also I would ask you in your updating to drop the hardback version and present the paperback under the title **Cybernetics of the Sacred**, Doubleday Anchor $2.50. Beside saving your readers $7.50 thru avoiding the bandits at Gordon and Breach of, it gives them a better version.

Glad to see you picked up on "The Superfluity of Naughtiness".

pax cyberneticus,

Paul Ryan
High Falls, New York

I stand admonished but not convinced. The map is not the territory. Even less is it the trip. – SB

SOCIOBIOLOGY

BY GINA BARI KOLATA

This article from Science, *10 Jan. '75, is a measure of the increasing use of co-evolution concepts in ecology. It's also a measure of how co-evolution (between species), co-adaptation (within species) and co-learning (within lifetimes) can blend indistinguishably in the realm of animal behavior. The article is by the same mysterious lady who wrote "Theoretical Ecology: Beginnings of a Predictive Science" reprinted in the Spring 1974* CQ.

— SB

Altruism, faithfulness to one's mate, parental sacrifices for the young, and other similar behavioral patterns occur in many species, ranging from social insects to mammals. Although numerous descriptions of such behavior have been published, only recently have models been proposed to explain why these patterns are so widespread. These models ascribe social behavior to a kind of genetic imperative — that is, behavior of individuals evolves so as to maximize their genetic contribution to the next generation. This far-reaching notion is the basis of an emerging field of inquiry known as sociobiology, which seems to be having an impact on the design of field studies of animal behavior and is also attracting the attention of social scientists as well as stirring up controversy among them.

Young birds often help their parents at the nest in the care of younger siblings. This type of altruistic behavior can be explained by proponents of sociobiology as follows: In order to maximize their genetic contribution to posterity, individuals would be expected to help their close relatives more often than they would help other members of their society. By helping close relatives, who are more likely to share their genes, individuals may increase the likelihood that their genes would be represented in future populations. This explanation of altruism as a form of selfishness, developed in part by W. D. Hamilton of the University of London, has been applied to explain behavior by individuals of many species, including social insects, birds, fish, and primates.

Ants, bees, and wasps, which are social insects that exhibit complex behavior, are often cited as a test case for theories of altruism because of the peculiar genetic relationship between brothers and sisters of these species. Males are haploid whereas females are diploid. (Fertilized eggs become females; unfertilized eggs become males.) Sisters, then, have in common an identical set of genes inherited from their haploid father. Thus sisters are more closely related to each other than to their brothers who have none of the father's genes and only half of their mother's genes. Hamilton predicted that females of these species should be more altruistic toward their sisters than toward either their brothers or their own offspring. According to Edward O. Wilson of Harvard University, there are many examples of behavior consistent with Hamilton's predictions and none that are inconsistent with them.

The manifestations of altruism toward close relatives have been carefully documented in birds. For example, Glen Woolfenden of the University of South Florida in Tampa finds that the offspring of the Florida scrub jay stay with their parents and do not breed for at least 1 to 3 years after they have matured and that they help their parents, primarily by guarding the nest against predators. A newly mated pair of these birds, who have not yet acquired offspring that could serve as helpers, suffer an increased chance that their offspring will not survive predation. Consistent with theory, Florida scrub jays — almost without exception — only guard nests of their parents, a parent and stepparent, or a sibling.

Sandra Vehrencamp of Cornell University in Ithaca, New York, has documented another type of altruistic behavior among birds. Groove-billed anis in Costa Rica build nests that are often densely distributed and close to the ground where they are easily preyed upon. These birds, Vehrencamp finds, appear to react to threats of predation by sharing nests. This results in a reduction in the number of nests in an area and decreases the likelihood that nests will be found by predators. Nests are sometimes shared by brothers. Vehrencamp notes that other birds, such as ostriches, rheas, magpie geese, and tinamous, also live at high densities and build nests on the ground where they are vulnerable to predation and have evolved so that females share a nest.

Sociobiological theories of altruism have been applied to primate behavior by Richard Alexander of the University of Michigan in Ann Arbor and by others. Among other examples, Alexander mentions that in primate societies older siblings often care for their younger brothers and sisters. More experienced, but unrelated, members of the group do not provide help.

An individual would be expected to help unrelated organisms only if that individual could expect its altruism to be reciprocated and if the risk associated with altruism is exceeded by the benefits expected by reciprocation. This behavior, called reciprocal altruism by Robert Trivers of Harvard University, can also occur between members of two species if each has more to gain than lose by such a relationship. Trivers cites cleaning symbioses in fish as an example of such behavior. One fish, the host, is cleaned of parasites by another fish or by a shrimp. The cleaner often enters the mouth and gill chambers of the host to do its job, but has never been observed to be eaten. Since cleaners are essential to the host's survival, sociobiologists would predict that the host's behavior, when it refrains from eating its cleaner, is inherited rather than learned. As evidence for this proposal, Trivers describes an experiment in which a grouper fish was raised from infancy alone in a tank, during which time it snapped up anything dropped in the tank. Since the grouper was apparently free from parasites, it did not need a cleaner. After the grouper had lived alone for 6 years, a small live cleaner was dropped into its tank. Rather than snapping up the cleaner, the grouper assumed a position it had never before been observed to assume and opened its mouth and spread its gills to allow the cleaner free access to its body.

Members of social groups may have different genetic groups that lead to conflicts of interest among related and unrelated individuals. Predictions about kinds and degrees of conflict are being tested by both observations and experiments involving a wide variety of species. By means of one such experiment, David Barash of the University of Washington in Seattle has been able to verify that a type of sexual conflict known among humans and predicted to occur among birds, does indeed occur in at least one species of mountain bluebird.

Mountain bluebirds, like most bird species, are monogamous. Males invest time and effort in raising and protecting their offspring. Thus a male mountain bluebird might be expected to react violently if it appeared as though his mate might have been fertilized by another male. Barash verified that such violent behavior occurred when a model of a male mountain bluebird was placed near a female while her mate was out foraging for food. When Barash performed this experiment during the breeding season, the returning male attacked both

© Copyright 1975 by the American Association for the Advancement of Science.

The helper phenomenon in the Florida scrub jay Aphelocoma coerulescens. *At the nest the two parents and a yearling feed the nestlings, which are the siblings of the helpers. To the right two other helpers have spotted an indigo snake* (Drymarchon corais), *one of the dangerous predators of jay nestlings. One crouches on the ground in a threat posture. The other perches nearby in the "hiccup stance," an alarm signal that will soon alert the birds at the nest. [Drawing by Sarah Landry for E. O. Wilson,* **Sociobiology: The New Synthesis**, *copyright © 1975 by the President and Fellows of Harvard College]*

his mate and the model of a male. In one case, the returning male drove his female from the nest and took another mate — a virtually unheard of occurrence among these birds. When Barash performed his experiment after the female had laid her eggs, he never saw a returning male attack its mate, although it did try to drive away the model of a male.

Trivers suggests that the evolution of territorial aggression, during the breeding season, by males of monogamous species may be explained in part by the need to protect the male from investing in offspring sired by another male. He notes that a male pigeon without a mate is attacked by other males when it arrives alone at the group's nocturnal roosting place. When such a male acquires a mate, it is accepted by the other males of the group.

Courtship, too, Trivers believes, may have evolved so as to assure a monogamous male that he alone fertilized his mate. Thus a male would avoid copulating with a female upon first encountering her, and would court her until sufficient time had passed for the possibility to be ruled out that she had been inseminated by another male. Trivers supports this hypothesis with evidence that monogamous birds have long courtship periods, whereas promiscuous birds do not.

Trivers has recently proposed a model of another kind of conflict — that between parents and offspring — in terms of the premises of sociobiology. Parents and offspring, he reasons, have different interests. Parents want to maximize their genetic contributions to posterity and so want to raise to maturity as many offspring as possible. Offspring want to monopolize their parents' care. Subjects of conflict, then, might include the amount of parental investment in offspring, how long the period of parental investment should last, and how altruistic and egotistic the offspring should be toward the other relatives. Several investigators have observed conflicts between parents and offspring that are consistent with predictions of this theory.

Weaning conflict is a particularly well documented example between parent and offspring that can be explained in terms of Trivers's hypothesis. When an infant is first born, nursing would be in the interest of both the mother and the infant. Later, the infant would want to continue nursing, whereas the mother would want to devote her attention and give her milk to new infants. Weaning conflicts are known to occur among dogs, cats, rhesus macaques, and sheep.

Conflicts between parents and offspring, altruism toward relatives or those unrelated individuals who might reciprocate, and sexual conflicts have obvious analogs in human behavior. Several sociobiologists are anxious to extend their theories to explain phenomena described by anthropologists, psychologists, and sociologists. Many social scientists, however, are uneasy about this extension of sociobiology. They worry that theories in sociobiology seem too facile. "They can explain everything," complains one anthropologist, "and, in effect, explain nothing." Others bring up the old nature-nurture quandary: How does one distinguish between inherited and acquired traits in humans? Alexander suggests that this distinction may be irrelevant and that even learned behavior might be analyzed in terms of sociobiology since, for example, some things are learned more easily than others.

Barash, who is a psychologist as well as a sociobiologist, cautions that investigators must differentiate between analogy and homology. The finding that similar behavior is exhibited among insects, primates, and humans does not necessarily indicate that such behavior has a similar cause. The analogy between behavior among humans and other animals is still intriguing, however. Even the most cautious of sociobiologists are convinced that their approach to the study of animal behavior will have to influence those who study only humans. Stuart Altmann of the University of Chicago believes that the most important influence of sociobiology on the social sciences will be the "delicate, nondisruptive" methods sociobiologists use and the types of questions they ask. In this way, at least, sociobiology is being predicted to change the direction of research in the social sciences. ■

Additional Reading

1. R. D. Alexander, in Annual Review of Ecology and Systematics, R. F. Johnson, P. W. Frank, C. D. Michener, Eds. (Annual Reviews, Palo Alto, Calif., 1974), vol. 5, pp. 325-383.
2. R. L. Trivers, Amer. Zool. 14, 249 (1974).
3. E. O. Wilson, Sociobiology: The New Synthesis (Belknap, Cambridge, Mass., in press).

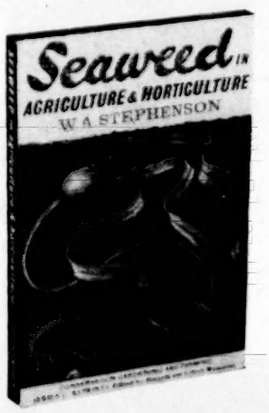
Seaweed in Agriculture and Horticulture

Seaweed will become more important both for what it contains and because it is a naturally occurring, renewable fertilizer source. This is an American paperback edition of an English hardback book by the man who developed the patented Maxicrop seaweed extraction process. You don't have to read this book to use seaweed, but it is worth the price. Includes solution strengths for soaking seeds before germination, and for foliar sprays (giving nutrients to plants through their leaves in a liquid spray) for specific fruit and vegetable crops. Also has a chapter called "How Plants Grow" which is the best short explanation (19pp.) I've seen.

– Richard Nilsen

Seaweed in Agriculture and Horticulture
W. A. Stephenson
1974; 241pp.
$5.50 postpaid
from:
Bargyla Rateaver
Pauma Valley, CA 92061

Maxicrop seaweed available from:
Bargyla Rateaver
Pauma Valley, CA 92061
or
Maxicrop U.S.A., Inc.
P.O. Box 964
Arlington Heights, IL 60006



Seaweed contains all major and minor plant nutrients, and all trace elements; alginic acid; vitamins; auxins; at least two gibberellins; and antibiotics.

Of the seaweed contents listed after nutrients and trace elements, the first, alginic acid, is a soil conditioner; the remainder, if the word may be forgiven in this context, are plant conditioners. All are found in fresh seaweed, dried seaweed meal and liquid seaweed extract – with the one exception of vitamins: these, while present in both fresh seaweed and dried seaweed meal, are absent from the extract.

•

Liquid extracts of seaweed are made by stirring macerated seaweed in a vat containing hot water, or by alkaline hydrolysis under steam pressure. The first is the simpler method, but it extracts only about half the essential part of the seaweed – the easily soluble portions, which are largely mineral. The second, which involves processing the seaweed inside a pressure chamber, breaks down its cell structure and sugar- and starch-like substances, and thus makes it possible to extract practically all the seaweed's essential constituents . . . The technique of hydrolysis under steam pressure is the one used by my company; and where the cost of carrying water is heavy, for example in export markets, we sell this liquid extract in dehydrated form as a powder which is easily reconstituted with cold water at the point of use.

•

Seaweed meal and liquid extract are made from the same varieties of seaweed, and have certain qualities in common. Both provide traces of nearly every mineral element found in the earth's crust. And both, by stimulating the action of soil bacteria, help them to release to plants the phosphorus and potash present, in ample supply, in the soils of most temperate regions.

There are also differences. Meal may take months to become fully effective in the soil as a plant nutrient and soil conditioner. Extract, which can be absorbed by the plant through its leaves, as well as through its roots, may be fully effective, as plant nutrient, within hours.

•

Although a plant's ability to absorb moisture through its leaves has been guessed at, it was not until recently that its ability to absorb nutrients in the same way was suspected – although it has been known for at least fifteen years that trees can absorb nitrogen from rain, particularly in thunderstorms. Before then, it was thought that a plant's roots were the only organ which took up food, and that leaves were concerned only with photosynthesis, transpiration and, possibly, the taking up of small amounts of moisture.

Now, however, it has been proved by the use of radio isotopes that the stems, leaves and fruit of plants can absorb nutrients in solution – and that rain and mist can also leach away those nutrients through the same channels. As a result, foliar spraying has become a commercially valuable way of presenting plants, and particularly fruit trees, with easily absorbed nutrient through their leaves, thus bypassing the soil.

•

But in this matter of trace elements seaweed has two further advantages. It has all the trace elements: and it has them in organic form. It has been proved beyond doubt that plants suffering from trace element deficiency absorb chelated minerals where they cannot absorb straight inorganic salts. The valuable tonic effects of organic trace elements even to plants in good health have also been proved. It is now accepted that 'organic' metals are also superior to 'inorganic' where the diet of animals and men is concerned – and that much of the beneficial effect of seaweed in feedingstuffs results from the chelated minerals it contains. The fact that low concentrations of 'organic' elements are just as effective as higher concentrations of 'inorganic' elements also means that the animal's needs can be satisfied without the danger of poisoning, or of making other elements unavailable.

•

RECOMMENDED RATIONS FOR STOCK

Seaweed, unless fed directly to animals in seaside areas, is given in the form of meal. This may be eaten as it is, as part of a farm-mixed ration, or as part of a balanced feedingstuff produced by a manufacturer. Both the meal and the balanced rations which include it are available in powder form, or compressed in nuts.

The golden rule of livestock feeding, that all changes should be made gradually, applies to the introduction of seaweed into an animal's diet. Calves, when introduced to seaweed meal at six to seven weeks old, should be given 1 oz. a day only, mixed with their rations. Cattle, if not brought up on seaweed, should at first have only 2.5 per cent of their ration in the form of seaweed meal. This may be increased to between 5.0 and 7.5 per cent over a matter of three to four weeks. If the meal is given to combat infertility, the proportion may be raised to 10 per cent. Many months' feeding on this scale may be necessary before some of the more obstinate conditions are cured.

Pigs should be given only 2.5 per cent of their rations in the form of meal at first. The proportion may then be increased gradually until it reaches 5.0 per cent.

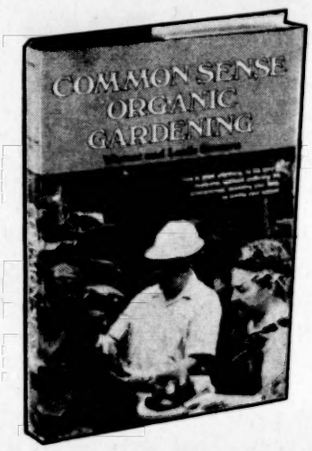
Poultry can take from 5.0 to 7.5 per cent of their rations in the form of seaweed meal, and do not seem to need gradual introduction to it. Baby chicks can begin eating it at once.

Recommended amounts for other animals are, for horses, up to ½ lb. a day; for goats, up to 4 oz. a day; and for sheep, up to 4 oz. a day also, depending on the size of breed.

Common Sense Organic Gardening

Older people with a little money, some yard, and lots of time should find this book worth its price. How to give meticulous care to a piece of ground and reap the rewards — in harvest, in bird-watching, in sipping dandelion wine. Some labor is required, but the authors themselves are over 50 and have geared their methods to their abilities.

— Rosemary Menninger



Common Sense Organic Gardening
Warner and Lucile Bowers
1974; 220pp.
$8.95 postpaid
from:
Stackpole Books
Cameron and Kelker Streets
Harrisburg, PA 17105
or Whole Earth

By way of summary, we should say that we are not in favor of heavy work. Mulching does away with hoeing, plowing, cultivating and most of the weeding. The wire towers, left up all year, prevent vine sprawl and put the squash and cucumbers at waist or shoulder height. The chicken wire berry trellises eliminate a briar patch and afford walking room between rows with berries at shoulder height. The white row stakes, left in permanently, mark off rows and paths, obviating laying out the garden each year.

Suttons Seeds

This English seed catalog is beautiful — nice layout and excellent color photography. Extensive selection of flowers and vegetables. Prices are cheaper than American catalogs (I compared it with Burpee), but you'll have to weigh this against a 20% handling and postage charge for orders under £10. And if you order heavier seeds (peas, beans, turnips, grass seed) and want them shipped Airmail, this figure is 45%.

(The British pound is currently hovering around $2.40 American. Also, instead of writing a check, you'll need to go to a large bank and obtain a Bank Draft. This is faster than the other alternative, which is an International Money Order, obtained from any Post Office.)

I couldn't find a price for an initial catalog — presumably it's free — but to have it sent the next year you must do at least £2 of business.

— Richard Nilsen
[suggested by Doug Dylla]

Suttons Seeds
catalog from:
Suttons Seeds Ltd.
Reading
RG6 1AB
England

Growing Up Green

Avid gardening parents may not need Growing Up Green *if they know the fascination of gardening well enough to impart it to children. But parents new to gardening, community garden managers, and especially teachers will find this imaginative book full of projects and simple, sophisticated information.*

— Rosemary Menninger
[suggested by Susan Reed]

Growing Up Green
Parents & Children
Gardening Together
Alice Skelsey and
Gloria Huckaby
1973; 240pp
$4.95 postpaid
from:
Workman Publishing Co.
231 E. 51st Street
New York, NY 10022
or Whole Earth

The Herb Book

The Herb Book *will become a standard reference on herb plants (including some trees, shrubs and seaweeds). By bridging the gap between wild food books and lore-packed herbals, it offers an herb gardener a key to ordering or gathering seed of unheard-of plants.*

514 herbs are discussed, giving common names, description of the plant and the part used, and recipes for use (infusions, tinctures, poultices, etc.). Specific information on cultivation is not included, but in most cases the plant's natural habitat is listed and provides a useful clue. 126 pages of charts, glossaries, and indexes, including a cross index of Latin and common English names.

— R.M. and R.N.
[suggested by Lee Wakefield]

The Herb Book
John Lust
1974; 659pp.
$2.50 postpaid
from:
Bantam Books, Inc.
666 Fifth Avenue
New York, NY 10019
or Whole Earth

232 **JASMINE**
(Jasminum officinale)

Medicinal Part: Flowers.

Description: Jasmine is a vinelike plant indigenous to the warm parts of the eastern hemisphere and now cultivated also in gardens in the southern U.S. Jasmine has opposite, dark green, pinnate leaves and sweet-smelling white flowers.

Properties and Uses: Calmative. According to old herbals, jasmine flowers calm the nerves. However, others suggest that the scent arouses erotic interests, and a few drops of jasmine oil (if you can afford it) massaged on the body with some almond oil may help overcome frigidity. In India, jasmine is used as a remedy for snakebite, and the leaves are used for eye problems.

The Culture of Agriculture

BY WENDELL BERRY

Wendell Berry, 40, is, in one life, a serious farmer and a top-notch novelist, poet, and essayist. As a result he's become something of an amalgamated hero to three different populations of readers – other writers, environmentalists, and lovers of fundamental skills.

His two pieces in this issue ("The Preservation of Old Buildings" is on p. 50) appeared, somewhat edited, in the **Los Angeles Times** *a few months ago. Here, they are unexpurgated. There's more Wendell Berry on CATALOG pp. 24-25, 48 and EPILOG p. 463. For a rich Kentucky novel try* **The Memory of Old Jack** *(Harcourt Brace Jovanovich, 1974).*

–SB

In my boyhood, Henry County, Kentucky was not just a rural county, as it still is. It was almost entirely a *farming* county. The farms were generally small. They were farmed by families who lived not only upon them, but within and *from* them. These families grew gardens. They produced their own meat, milk, and eggs. They were highly diversified. The main money crop was tobacco. But the farmers also grew corn, wheat, barley, and oats; sorghum and hay for forage. Cattle, hogs, and sheep were all characteristically raised in association on the same farms. There were small dairies, the milking more often than not done by hand. Those were the farm products that might have been considered major. But there were

Photos by James Baker Hall

Agriculture. Farmer Berry carts farmer neighbors around a Henry County hillside. Team: Nell and Chris.

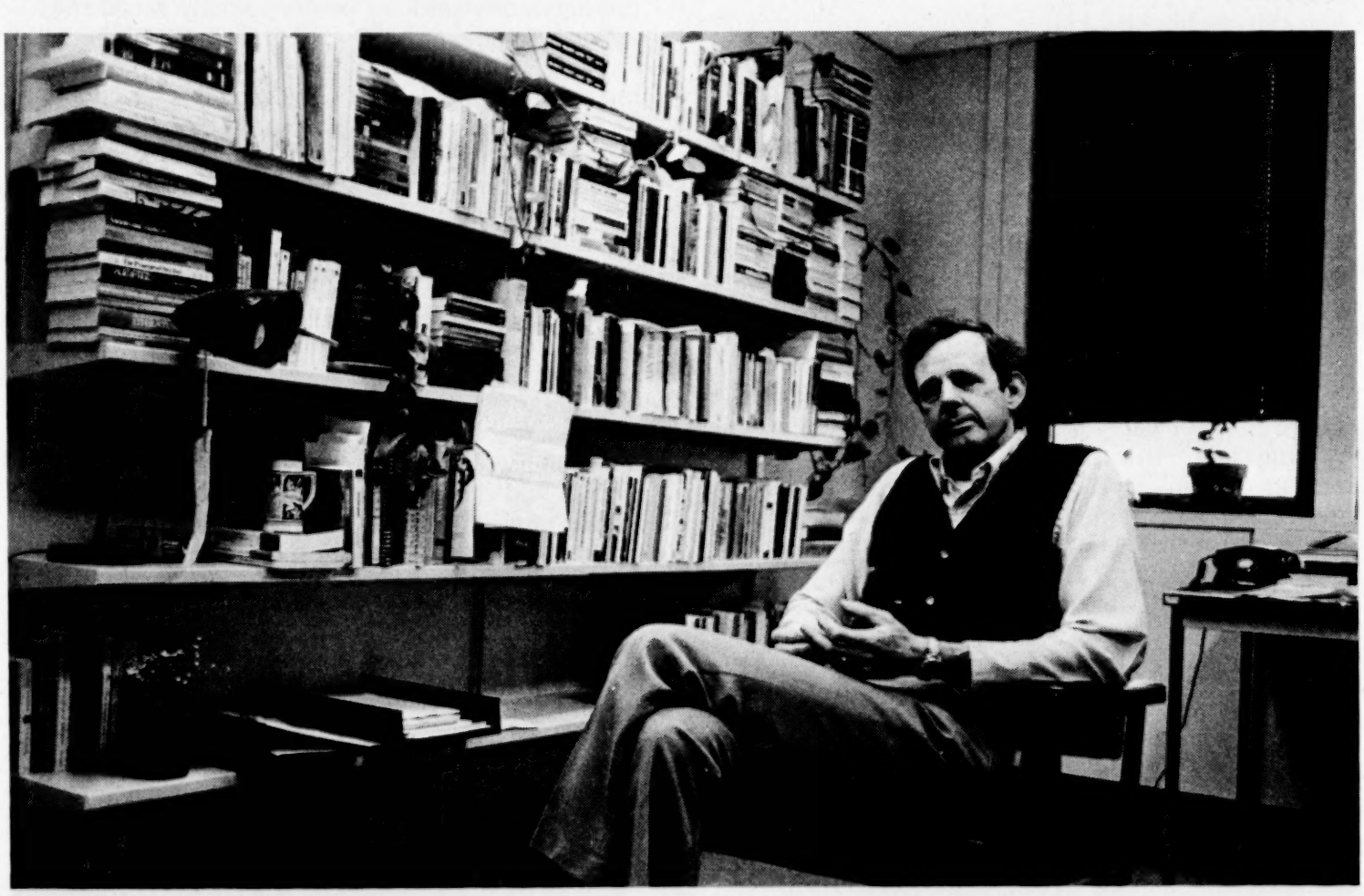
also minor products, and one of the most important characteristics of that old economy was the existence of markets for those minor products. In those days a farm family could easily market its surplus of cream, eggs, old hens, and frying chickens. The major motive power for field work was still furnished by horses and mules. There was still a prevalent pride in workmanship, and thrift was still a forceful social ideal. The pride of most people was still in their homes, and their homes looked like it. This was by no means a perfect society. Its people had often been violent and wasteful in their use of the land and of each other. Its present ills had already taken root in it. But I have spoken of its agricultural economy of a generation ago to suggest that there were also good qualities indigenous to it that might have been cultivated and built upon.

That they were not cultivated and built upon — that they were repudiated as the stuff of a hopelessly outmoded, unscientific way of life — is a tragic error on the part of the people themselves; and it is a work of monstrous ignorance and irresponsibility on the part of the experts and politicians who have prescribed, encouraged and applauded the disintegration of such farming communities all over the country into our allegedly miraculous "modern American agriculture."

In the decades since World War II the farms of Henry County have become increasingly mechanized. Though they are still comparatively diversified, they are less diversified than they used to be. The holdings are larger, the owners are fewer. The land is falling more and more into the hands of speculators and professional people from the cities, who — in spite of all the scientific agricultural miracles — still have much more money than farmers. There are not nearly enough people on the farms to maintain them properly, and they are for the most part visibly deteriorating. The number of part-time farmers and ex-farmers increases every year. Our harvests depend more and more upon the labor of old men and little boys. The farm people live less and less upon their own produce, more and more from the grocery stores. The best of them are more worried about money and more over-worked than ever before. Among the people as a whole, the focus of interest has largely shifted from the household to the automobile; the ideals of workmanship and thrift have been replaced by the goals of leisure, comfort and entertainment — for, as my friend, Maurice Telleen says, this nation has created the world's first broad-based hedonism.

And nowhere that I know is there a market for a hen or a bucket of cream or a few dozen eggs. Those markets were done away with in the name of sanitation — but to the enormous enrichment of the large producers. Future historians will no doubt remark upon the inevitable association, with us, between sanitation and filthy lucre. It is, of course, one of the miracles of science that the germs that used to be in our food have been replaced by poisons.

[more →]



Culture. Professor Wendel Berry in his English Department lair at the University of Kentucky, Lexington.

In all this few people whose testimony would have mattered have seen the connection between the "modernization" of agricultural techniques and the disintegration of the culture and the communities of farming. What we have called agricultural progress has, in fact, involved the forcible displacement of millions of people.

I remember, during the fifties, the outrage with which certain of our leaders spoke of the forced removal of the populations of villages in communist countries. I also remember that at the same time, in Washington, the word on farming was "Get big or get out" — a policy that is still in effect. The only difference here is in method: the force used by the Communists was military; with us, it has been economic — a "free" market, in which the freest were the richest. The attitudes are equally cruel, and I believe that in the long run the results will be equally damaging — not just to the concerns and values of the human spirit, but to the practical possibilities of survival.

And so those who could not get big have got out — not just in my community but in farm communities all over the country. But bigness is a most amorphous and unstable category. As a social or economic goal, it is totalitarian; it establishes an inevitable tendency toward the tyrannical *one* that will be the biggest of all. Many who got big to stay in are now being driven out by those who are still bigger. The aim of bigness implies not one social or cultural aim that is not noxious. Its influence on us may already have been disastrous, and we have not yet seen the worst.

And this community-killing agriculture, with its monomania of bigness, is not primarily the work of farmers, though it has burgeoned upon their weaknesses. It is the work of the institutions of agriculture; the experts and the agri-businessmen, who have promoted so-called efficiency at the expense of community, and quantity at the expense of quality.

In 1973 1,000 Kentucky dairies went out of business. They were the victims of policies by which we imported dairy products to compete with our own, and exported so much grain as to cause a drastic rise in the price of feed. Typically, an agricultural expert at the University of Kentucky was willing to applaud the failure of 1,000 dairymen, whose cause he is supposedly being paid — with *their* money — to serve. They were inefficient producers, he concluded, who needed to be eliminated. He did not say — indeed, there was no indication that he had ever considered — what might be the limits of his criterion or his logic. Does he propose to applaud this same process year after year until "biggest" and "most efficient" become synonymous with "only"? This sort of brainlessness is invariably justified by pointing to the enormous productivity of American agriculture. But any abundance, in any amount, is illusory if it does not safeguard its producers — and in American agriculture abundance has tended to destroy its producers.

Along with the rest of the society, the established agriculture has shifted its emphasis — even its interest — from quality to quantity. And along with the rest of society it has failed to see that, in the long run, quantity is inseparable from quality. To pursue quantity alone is to destroy those disciplines in the producers that are the only assurance of quantity. The preserver of abundance is excellence.

What are the results of such thinking?

The results are a drastic decline in farm population and political strength; the growth of a vast, uprooted, dependent and unhappy urban population. (Our rural and urban problems have largely caused each other.) The result is an unimaginable waste of land, of energy, of fertility, of human beings. The result is that the life of the land, which in its native processes, is infinite has been made totally dependent upon the finite, scarce and expensive products of industry. The result is the disuse of so-called marginal lands, potentially productive, but dependent upon intensive human care and long-term human familiarity and affection. The result is the virtual destruction of the farm culture without which farming, in any but the exploitive or extractive sense, is impossible.

My point is that food is a cultural, not a technological, product. A culture is not a collection of relics or ornaments, but a practical necessity, and its destruction invokes calamity. A healthy culture is a communal order of memory, insight, value, and aspiration. It would reveal the human necessities and the human limits. It would clarify our inescapable bonds to the earth and to each other. It would assure that the necessary restraints be observed, that the necessary work be done, and that it be done well. A healthy *farm* culture can only be based upon familiarity; it can only grow among a people soundly established upon the land; it would nourish, and protect, a human intelligence of the land that no amount of technology can satisfactorily replace. The growth of such culture was once a strong possibility in the farm communities of this country. We now have only the sad remnants of those communities. If we allow another generation to pass without doing what is necessary to enhance and embolden that possibility, we will lose it altogether. And then we will not only invoke calamity — we will deserve it.

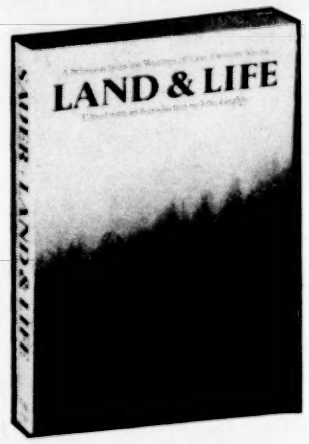
Several years ago I argued with a friend of mine that we might make money by going ahead and marketing some inferior lambs. My friend thought for a minute, and then he said: "I'm in the business of producing *good* lambs, and I'm not going to sell any other kind." He also said that he kept the weeds out of his crops for the same reason that he washed his face. Surely no one would question that the human race has survived by that attitude. It *still* survives by that attitude, though now it can hardly be said to know it, much less acknowledge it.

But this attitude does not come from technique or technology. It does not come from education; in more than two decades in universities I have rarely seen it. It does not come even from principle. It comes from a passion that is culturally prepared — a passion for excellence and order that is handed down to young people by older people whom they respect and love. When we destroy the possibility of that succession we will have gone far toward destroying ourselves. ■

Land & Life

The work of Carl O. Sauer is a rich guide, and a continual source of stimulation for Anyman's journey into the American Past. For over fifty years Dr. Sauer has been providing us with a series of incredibly compact & skillfully rendered 'portraits' of the forgotten peoples of the New World — Indians, proto-Indians & backwoods Whites — the people, it now seems, who have much to teach us about living here in balance with the American Earth. An historical geographer by training, and a man who has made many important contributions to the new social & environmental sciences — in short, a scholar's scholar — Dr. Sauer nonetheless writes clearly, and with great precision — a fact that has not been lost on some of the more important poets of our time. **Land and Life** *is a selection of Dr. Sauer's 'portraits', and can be easily slipped into your bookshelf right between the work of Basho & Lao Tsu.*

— Robert Callahan



Land & Life
Carl O. Sauer
1963, 1974; 435pp.
$3.95 postpaid
from:
University of California Press
2223 Fulton Street
Berkeley, CA 94720
or Whole Earth

Dispersed living, the isolated family home, became most characteristic of the "Northern" folk on the frontier. In Europe nearly everyone had lived in a village or town; in this country the rural village disappeared or never existed. Our farmers lived in the "country" and went to "town" on business or pleasure. The word "village," like "brook," was one that poets might use; it was strange to our western language. Land was available to the individual over here in tracts of a size beyond any holdings he might ever have had overseas. The village pattern was retained almost only where religious bonds or social planning prescribed living in close congregation.

•

The Old World peasant agriculture, by placing animal products first, has maintained a condition of the soil in which cover crops and animal manuring have kept the soil profiles reasonably intact. Parts of our Northeast show similar maintenance of natural balance by culture.

•

We may follow Bluntschli in saying that one has not fully understood the nature of an area until one has learned to see it as an organic unit, to comprehend land and life in terms of each other.

•

May a preselective bent toward geography be recognized before it asserts itself as deliberate election? The first, let me say most primitive and persistent trait, is liking maps and thinking by means of them. We are empty-handed without them in the lecture room, in the study, in the field. Show me a geographer who does not need them constantly and want them about him, and I shall have my doubts as to whether he has made the right choice of life. We squeeze our budgets to get more maps, of all kinds. We collect them from filling stations to antique shops. We draw them, however badly, to illustrate our lectures and our studies. However little a member of your institution may know what you are doing as a geographer, if he requires map information he will call on you. If geographers chance to meet where maps are displayed (it scarcely matters what maps), they comment, commend, criticize. Maps break down our inhibitions, stimulate our glands, stir our imagination, loosen our tongues.

Aquaculture and the Fish Farmer

Aquaculture in North America is here to stay. In the past few years, a confusing welter of scientific and trade publications dealing with the subject have come out, some of them with overlapping titles. Most of those which have survived are controlled or owned by one segment of the industry (catfish, trout, etc.). **Aquaculture and the Fish Farmer** *is truly independent and, for the practical fish farmer whose interests are broader than one species or for the layman thinking of entering the field, it's the one to get. The magazine covers all species and types of aquaculture at all economic levels from agribusiness to homestead. Of particular interest is a regular column by Roy Prewitt, one of the deans of American aquaculture. Prewitt is argumentative and opinionated, and I don't like all of his ideas. But I do like a lot of his ideas, and he certainly has the experience. The ads are a help, too.*

— Bill McLarney
The New Alchemists

Aquaculture and the Fish Farmer
M. E. "Pete" Thornton
$5.00 year
$8.00/2 years
from:
Aquaculture and the Fish Farmer
P.O. Box 1837
Little Rock, AR 72203

During the summer of 1971 I quite accidentally came upon a method of growing midge larvae which circumvented the limitations of both existing systems and minimized the inputs of both labor and technology. I was carrying out experiments with freshwater clams in outdoor aquaria fertilized with horse manure suspended in cloth bags. Not too long after the initial fertilization, I found midge larvae clinging to the bags.

This suggested that it might be possible to culture midge larvae by suspending cloth sheets in fertilized ponds. If the system worked, all that would be necessary to feed fish would be to remove the larvae-covered sheets from the culture pool, suspend them in the fish pond and let the fish do the work of harvesting.

Removing the midge larvae-covered burlap sheet from the production pond.

Horse Sense and Road Apples

A pastured horse is a little like a parked car, except the car isn't grazing and the horse doesn't need tires.

The side saddle was invented when it was determined that women could derive pleasure from straddling a horse.

Horse pictures play an important part in American adolescent development.

I bought a bareback rigging once,
gonna take up the rodeo.
Young Gary Holly went and got ruptured.
Little Benny, my cousin's first husband,
was a better rider than me.
He ended up owing me something for the rigging.

On Horseshoeing: You are never going to be stronger than the horse. You can be smarter most of the time. If you are going to try to shoe just any old horse, it would help to know how to throw the horse.

There was a sign at the Methodist Church in Alliance Nebraska that said: "Horse sense is what keeps horses from betting on people." Last horse I bet on had so much bit in its mouth on the backstretch, I figured it was about time to turn to betting on the jockey.

I remember jumping off the roof of my Uncle Scoop's low barn, on to the backs of his horses. We'd let them out one by one. Jump, grab a couple of handsful of mane, try to last a few jumps, and watch that you kept the horse and yourself out of the fence.

If you are not strong in the arm, it doesn't hurt to knee a horse a little when you are cinching up.

Horses are like slaves in a way. Folks trade them for real high prices, and figure on making a profit most of the time.

Horses reproduce easier than tractors do.

Horses are, per capita, photographed more often than cattle.

Horses are like dogs. We don't eat them very often, but if they don't get along with us, we stop feeding them.

If people in cities who are worrying about continued food supplies would in some way support the use of horses for work, there would be fewer people and horses standing around hungry.

— J. D. Smith

Wilshire Horse Lovers' Library

One good thing about this series of books is that they are cheap, (from two to ten bucks) at a time when the publishing industry seems to be going for all the bread they can get. I have only looked at a half a dozen of the titles, and am recommending the entire series because those I did see were of good quality. There are quite a few reprints in the series: the horseshoeing guide is a 1941 War Department Manual, one of the vet books is from the early forties, the **Illustrated Book of the Horse** *was originally published in 1875. Most of the time old books about horses are a little better than new ones because horses used to be more widely used as tools than they are now.*

Of particular interest to me in this series are the two books on harness or driving horses. Horsepower as an energy concept has been bastardized by the automobile industry. One good horse will pull you and your family just as well as two hundred mechanical horsepower concepts will pull you and your family and your new 1975 Ford Rebate.

Pick a title of interest from the list and see for yourself.

— J.D.

Wilshire Horse Lovers' Library
Melvin Powers, editor
$2.00 to $10.00
25¢ postage
from:
Wilshire Book Company
12015 Sherman Road
North Hollywood, CA
91605

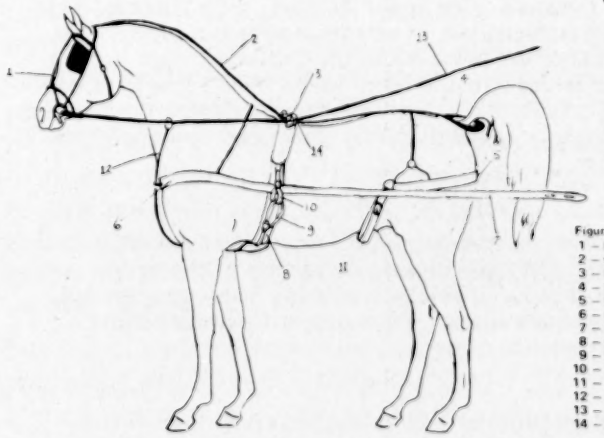


Figure 2. Complete Harness
1 – Bridle
2 – Checkrein
3 – Backpad
4 – Crupper
5 – Breeching
6 – Breastcollar
7 – Trace
8 – Surcingle
9 – Wrap Strap
10 – Shaft Loop
11 – Breeching Strap
12 – Running Martingale
13 – Line
14 – Ring Terret

WILSHIRE HORSE LOVERS' LIBRARY

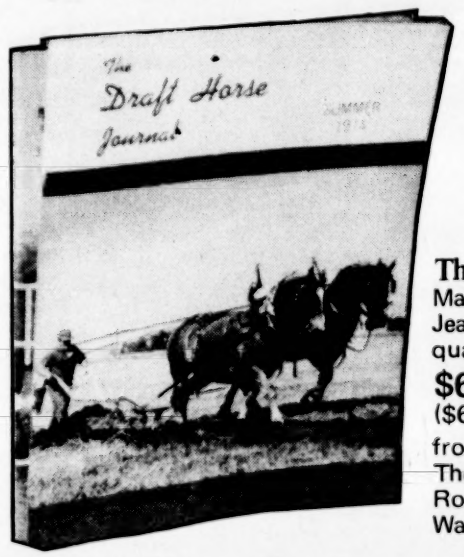
Amateur Horse Breeder A. C. Leighton Hardman $2
American Quarter Horse in Pictures Margaret Cabell Self $2
Appaloosa Horse Bill & Dona Richardson $2
Arabian Horse Reginald S. Summerhays $2
Art of Western Riding Suzanne Norton Jones $2
At The Horse Show Margaret Cabell Self $2
Back-Yard Foal Peggy Jett Pittinger $2
Back-Yard Horse Peggy Jett Pittinger $2
Basic Dressage Jean Froissard $2
Beginner's Guide to the Western Horse Natlee Kenoyer $2
Bits — Their History, Use and Misuse Louis Taylor $2
Blond Girl with Blue Eyes Leading Palomino (Full color poster 47" x 27") $5
Breaking & Training the Driving Horse Doris Ganton $2
Cavalry Manual of Horsemanship Gordon Wright $2
Complete Training of Horse and Rider Colonel Alois Podhajsky $3
Dog Training Made Easy & Fun John W. Kellogg $2
Dressage — A study of the Finer Points in Riding Henry Wynmalen $3
Driving Horses Sallie Walrond $2
Equitation Jean Froissard $3

The Draft Horse Journal

One good thing about the energy crunch is that it might take the generation that is going to have to live with it back into an examination of the use of horses as working, pulling, machines. The **Draft Horse Journal** *is the only American publication that I know about that is devoted exclusively to work horses, though the magazine does devote more space to the county fair pulling contests than it does to the actual logistics of getting work out of a horse.*

If you are thinking about harnessing up ol' Dobbin, then get ahold of a copy of this quarterly Journal. Their advertizing rates are cheap enough so many folks with used harness and equipment run little ads about their goods, and though their emphasis runs a little to the purebred side, they do provide access to mules, multi-team hitches, and horsedrawn equipment.

— J.D.
[suggested by Wendell Berry]



The Draft Horse Journal
Maurice and
Jeannine Telleen, editors
quarterly
$6.00 per year
($6.50 foreign)
from:
The Draft Horse Journal
Route 3
Waverly, IA 50677

First Aid for Horses Dr. Charles H. Denning, Jr. $2
Fun of Raising a Colt Rubye & Frank Griffith $2
Fun On Horseback Margaret Cabell Self $3
Horse Owner's Concise Guide Elsie V. Hanauer $2
Horse Selection & Care for Beginners George H. Conn $2
Horse Sense — A complete guide to riding and care Alan Deacon $4
Horseback Riding for Beginners Louis Taylor $3
Horseback Riding Made Easy & Fun Sue Henderson Coen $2
Horses — Their Selection, Care & Handling Margaret Cabell Self $2
How to Win at the Races Sam (The Genius) Lewin $2
Hunter in Pictures Margaret Cabell Self $2
Illustrated Book of the Horse S. Sidney (8½" x 11½") $10
Illustrated Horse Management — 400 Illustrations Dr. E. Mayhew $5
Illustrated Horse Training Captain M. H. Hayes $5
Illustrated Horseback Riding for Beginners Jeanne Mellin $2
Jumping — Learning and Teaching Jean Froissard $2
Lipizzaners & The Spanish Riding School W. Reuter (4½" x 6") $2.50
Morgan Horse in Pictures Margaret Cabell Self $2
Movie Horses — The Fascinating Techniques of Training Anthony Amaral $2
Police Horses Judith Campbell $2
Practical Guide to Horseshoeing $2
Practical Horse Psychology Moyra Williams $2
Problem Horses — Tested Guide for Curing Most Common & Serious Horse Behavior Habits Reginald S. Summerhays $2
Reschooling the Thoroughbred Peggy Jett Pittenger $2
Ride Western Louis Taylor $2
Schooling Your Young Horse George Wheatley $2
Stable Management for the Owner-Groom George Wheatley $3
Teaching Your Horse to Jump W. J. Froud $2
The Law and Your Horse Edward H. Greene $3
Trail Horses & Trail Riding Anne & Perry Westbrook $2
Treating Common Diseases of Your Horse Dr. George H. Conn $2
Treating Horse Ailments G. W. Serth $2
Wonderful World of Ponies Peggy Jett Pittenger (8½" x 11½") $4
Your First Horse George C. Saunders, M.D. $2
Your Pony Book Hermann Wiederhold $2
Your Western Horse Nelson C. Nye $2

Box 428, Sausalito, California 94965

THAT FLEXIBILITY OF POWER

One of the most common sights on country roads and in the fields these days is a tractor completely mismatched to the job it is performing . . . having 3, 4, 5, or 10 times as much horsepower as it needs to perform the task at hand . . . and burning high priced fuel like the brute it is. (The most ridiculous example that comes to mind: how much horsepower does it take to go get the cows in? Answer: it takes one saddle horse, one dog, or one person, but how many times haven't you seen a tractor used this way?)

That is one of the areas where the ideal of "mixed power" broke down. In most cases it was but a matter of time until a large tractor was used for a piddling job, just because it didn't need to be harnessed. Now, most farms have tractors in assorted sizes and colors, but the abuse cited above is still prevalent . . . and costly.

Contrast this with a moderate sized horse farm where the five or six horses are used on a two bottom plow in the spring. Plowing done, split them up, three or four for the disc and harrow and two for the planter and seeder wagon. Corn plowing, split them up again, maybe with a pair of two rows or a two row for dad and a single row for the boy. And, so on, throughout the crop season.

But, you say, with the high price of feed grains those horses are burning fuel too. They are, but it is home grown and renewable and that's a difference; and a couple of those mares are raising saleable colts and that's a difference, and that horse manure is helping make next year's crop and that's a difference.

But, you say, that's unreal . . . in 1974. Maybe it is, I don't know. From the number of farm sales every winter, I'd say some other programs that have been sold a whole lot harder must have been pretty unreal too. If this is a fairy tale, we sure don't have a monopoly on it. Just less publicity.

But, you say, why not have a tractor for the real heavy work, especially in the killing heat of the summer. Good idea. If you have the self discipline to use the tractor where it fits the bill, and the horses where they fit the bill. The record speaks for itself in that regard. This sort of discipline is something we don't seem to be much good at. But I think it is a good idea . . . when you can make it work.

It is, in fact, a great idea, and had it worked we would have tens of thousands more farmers today farming smaller diversified farms, patronizing thousands of additional machinery outlets, in thousands of healthier small towns. I've already cited the chief reason it didn't work from the farmer's side, the other side of the coin is found in the "winner take all" attitude of the tractor manufacturer. The only trouble in that winner take all business is that this wasn't a poker game, it was the health of our country's agriculture that was at stake. And to a considerable degree, the health of our country.

best horse story i ever heard

"had this little horse,
sagebrush sally outa sagebrush sue,
looking mighty rough,
right out of the '49 blizzard,
feeding on jimson weed all winter.
now,
i was backing her down out of this horse trailer,
see,
and this old boy come up to me,
says,
somethings wrong with that horse.
i says,
nothings wrong with that horse,
best damn roping horse this side of the niobrara.
well,
we got to looking around,
and,
that horse only had three legs,
(course you could hardly notice it.)
this fellow offers me two hunred buckeroos for ol' sal'.

went out that day,
roped everything there was to rope on her,
i was putting her up in the same trailer and,
this old boy comes up to me again,
says,
i'll give you ten thousand for that horse.
me,
i just looked him in the eye,
kinda smiled,
and says,
sheeeeeeeit."

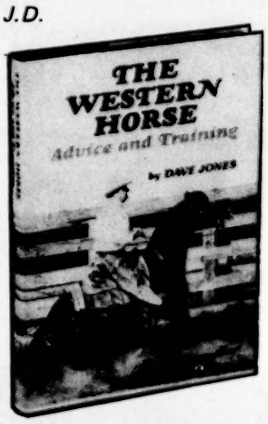
– J.D.

Western Horseman

The Western Horse: Advice and Training

This book supersedes Practical Western Training *(CATALOG p. 258) by the same author. As well as dealing effectively with all the subjects carried in PWT, this new book represents new insights and learnings by a fellow who has spent most of his life learning about horses. Best parts are his dedication to the hackamore, his discussion of the use of blindfolds, and the special section of ground handling, including how to rope, hobble, and throw a horse, trim hooves, use bowlines. All in all, this is a nice uncluttered piece of advice on breaking and training a horse to the cow business.*

– J.D.



The Western Horse: Advice and Training
Dave Jones
1974; 175pp.
$6.95 postpaid
from:
University of Oklahoma Press
Sales Office
1005 Asp Avenue
Norman, Oklahoma 73069
or Whole Earth

Horsemanship is controlling your temper.

I don't believe I would have thought of using the blindfold if I hadn't seen it so widely used in South America. We soon were blindfolding mares for shots, hoof trimming, doctoring, and the like and almost completely discarded the twitch.

One time we had a filly to doctor. She was a four-year-old with a hormone imbalance. I took a twitch with me, roped the filly, and screwed the twitch on her nose. Then the vet brought the shot. Popping the needle in her vein produced quick results. She reared and struck, hitting me in the shoulder before I could blink.

Now, you don't fight these Pasos. You try to get along with them, as you should with any horse. I knew that I might have to throw her and tie her down, but I tried the blindfold first. She stood, never moving at all, had her shot, and was released with no trouble.

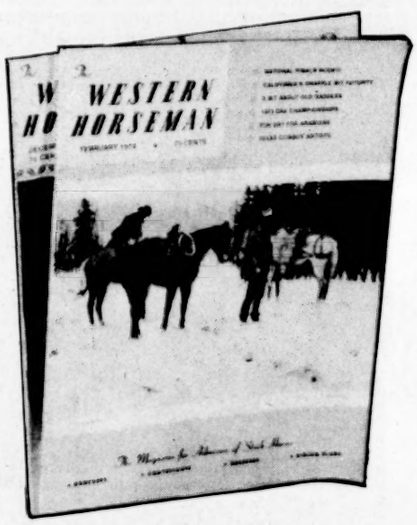
From all this I found the blindfold to be a very useful tool in horse handling. Nothing could be simpler to make. Cut a slit for the ears in a thirty-by-thirty-inch cheap cotton saddle blanket. A hole to tie a string in and another hole opposite can secure the blindfold under the jaw.

If you want a blindfold on your hackamore, soft latigo makes a good one. It's rigged right under the browband, on the headstall. The slits should be small so it will stay in place until you want to pull it down.

The Western Horseman

This is THE horse magazine of the American Cowboy, probably second only to Reader's Digest in subscriptions in ranchland. Includes a little of everything from rodeo fashions and twelve year old horsegirls looking for penpals, to new product evaluations (kickbacks?) and general coverage of all important national horse shows. It is quarter horse biased because the cattle industry is too, but every October it prints a special "All Breeds Issue" in which access information is published for all the various registries in this country. If you own a pleasure horse, here is your mag. If you plan on getting a horse when you get the rest of your shit together, you can do some nice picture-shopping while you wait. If you are scared of horses but like boots and hats, here is your mail-order marketplace. Not terribly organic in its philosophies, but might change with its readership.

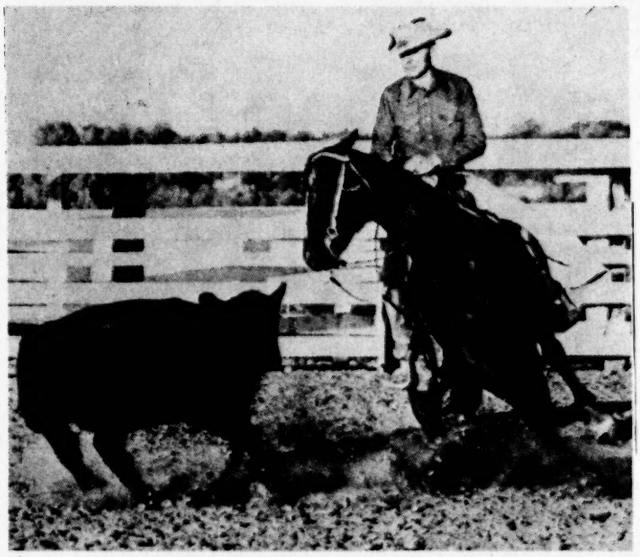
— J.D.



The Western Horseman
Chuck King, editor
monthly
$6.00 a year
from:
The Western Horseman
P.O. Box 7980
Colorado Springs,
CO 80933

Western Horseman

Lynne Curtis arrives in San Francisco at the end of her 2,200-mile trek that took her from Minneapolis to the west coast in 15 weeks.



Western Horseman

A 1956 photo of John cutting on Power Command, one of the R S Bar Ranch horses.

"I'm coming," yelled Lowell Cope as he vaulted onto his big buckskin colt. The colt was a three-year-old, and very green. Lowell forgot this as he gained the saddle and sunk his spurs into the colt. The young horse exploded into the air, dropped his head, drove his front feet into the ground. Lowell, caught completely by surprise, bucked off at the first jump, somersaulted in the air, and came down with his back on the colt's rump just as he was coming up on his second buck. The impact spun Lowell into a second somersault and as he descended behind the colt, the horse lashed both feet straight back. There was a loud thud as one foot caught Lowell's hat brim, knocking his hat off before he hit the ground. Looking back from my accelerating mare, I thought the kick had connected with poor Lowell's head. I was sure it was a fatal blow, and yelling, I set my horse up and whirled back towards the group, while the colt bucked away towards Flash. Lowell's body lay still for a moment after he had hit the ground with a sickening thump! I *knew* he had been killed. But in an instant, he came to life, leaped to his feet, and shrieking insanely started to tear at his chaps belt while he danced about madly. Robert solicitously ran over to Lowell. "Lowell," he cried, "Are you hurt?' To which Lowell responded, "Heck no, I'm on fire!"

It seems that he had a pocketful of wooden kitchen matches, and when he hit the ground, the matches had ignited. Lowell had a fire in his front Levi pocket. We stared dumbly as he stamped and leaped, hollering unintelligibly. Not until he had dropped both this chaps and his Levi's and we saw smoke billowing from his pocket did we understand what had happened.

Realizing that the emergency was under control, I turned Molly back to pursue the fast-disappearing Flash, leaving Lowell writhing on the ground in an effort to shed his batwing chaps along with his burning Levi's, a thing that is hard to do without taking off your boots and spurs.

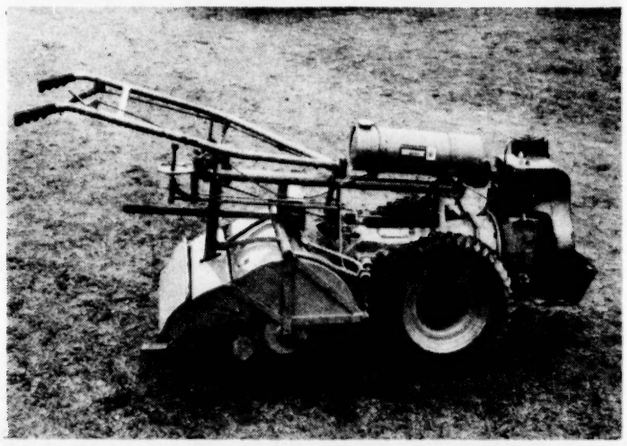
I still needed help, especially now that we had *two* runaway horses. I looked back over my shoulder. Tom Barr, who rode for Jerry Bowser's ranch, saw my dilemma. "Go on! I'm coming!" he shouted, stepping into the stirrup with his left foot. Unfortunately, he had forgotten to tighten his cinch, and as his horse broke into a run from a standing start, he tried to swing his right leg over the cantle. But the saddle turned under the horse's belly, taking the rider with it. The effect was similar to what one sees through the window of a rotating washing machine. It is hard to say which suffered the most — horse, rider, or saddle. The horse stepped right in the middle of Tom's belly, planting a foot in the center of a big rodeo trophy buckle the rider wore. The buckle was mangled, but probably saved its owner serious injury.

Small Tractors

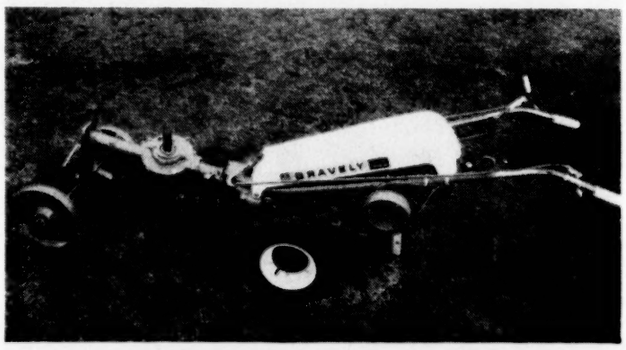
BY RICHARD NILSEN *photos by David Edwards*

The California Farm Equipment Show was held recently at Tulare, in the San Joaquin Valley. Most of the machinery was geared toward the state's thriving "agribusiness" industry, which in 1973 grossed 7.5 billion dollars. As American farm machinery companies produce bigger and bigger tractors, more of the small equipment is imported. (Many American firms do make a line of small tractors for lawn and garden use; they are usually under 20 h.p. and several of the salesmen I talked to referred to them frankly as toys.)

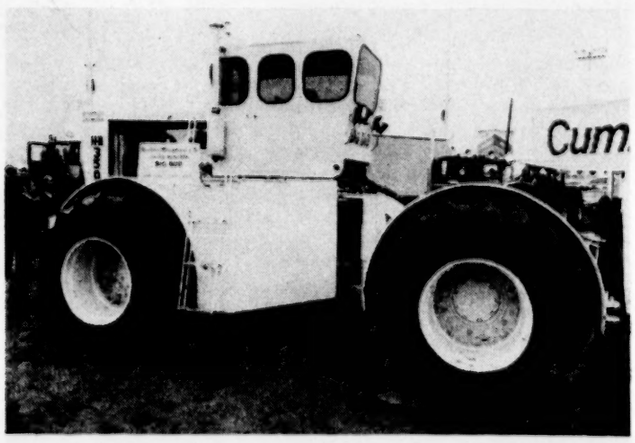
The tractors you see below are built for heavier work. But I have not tried them out, and these are not reviews in the sense of being recommendations. A small tractor review is easy: BUY A USED FARM TRACTOR — by far the best value. If, after looking at the price tags on new tractors you still want one, consider one other factor — service. The best designed, most exotic tractor in the world is no good to you if it won't run because you are waiting for a part to be shipped from the other side of the world. Many of the smaller imports have good U.S. service networks, but that really depends on where you live. If you have experience with these or other small tractors, new or used, and want to share it, please write.



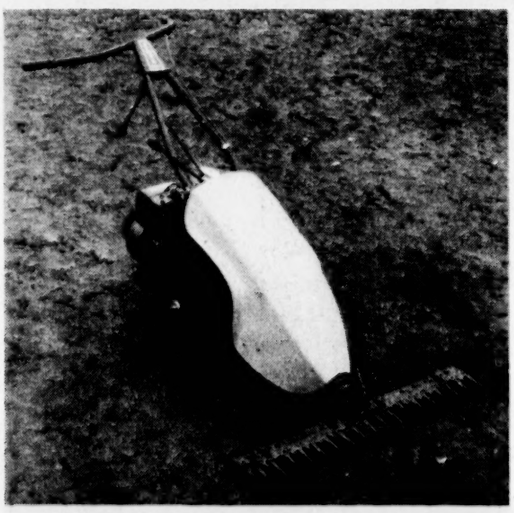
Howard Rotavator's largest walk-behind tractor, the "Gem," is shown above. It comes with either a 9.2 or 15.2 hp 4 cycle gas engine. With the smaller engine, this model costs $2,395. Dealers throughout the U.S.



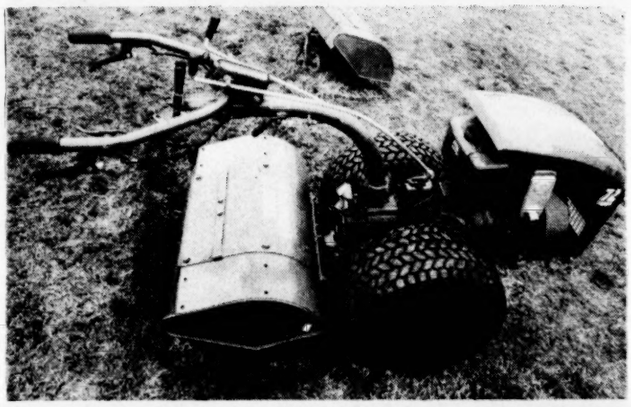
The smallest tractor Gravely Corporation makes is still their 7.6 hp gas powered "convertible tractor." It has a rotary plough, not a roto-tiller, and sells for $898.65. The T-head, 1 cylinder engine is the same design they have been using since the 1920's; 30 years of continuous use is not uncommon. Gravely is now entirely out of the shredder/composter business. (Gravely Corporation, Gravely Lane, Clemmons, North Carolina 27012.) (Also reviewed in CATALOG, p. 55.)

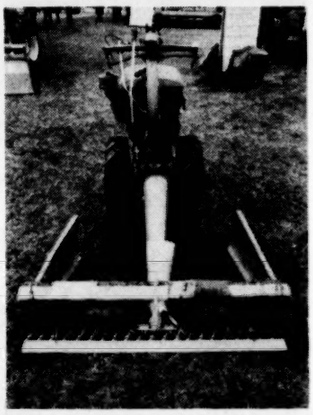


Typical of the direction that agribusiness is heading is "Big Bud," the largest wheeled farm tractor in the world. This Model HN-350 is powered by a Cummins 335 diesel, comparable in power to a Cat. D-8. The fuel tank holds 525 gallons and the tractor is able to pull 72 feet (width) of cultivators behind it at 5-6 mph. At that rate, it can cover 1000 acres in 24 hours. Built by Northern Manufacturing Co. of Havre, Montana, "Big Bud" costs $72,000.



The only sickle-bar mower still made in the U.S. is the Jari. The 4 hp gas-powered "Monarch" pictured above is their largest model. Bars range from 16" - 60"; the photo shows a 36" bar, and the unit costs $439.00. (Jari Division, Year-A-Round Cab Corp., P.O. Box 2075, Mankato, Minn. 56001.)





From Italy comes this Ferrari Model 72, their largest walk-behind model. The only roto-tillers in the world to be powered by air-cooled diesel engines, this one uses a Lombardini 14 hp diesel. One handy feature is that the handle pivots 180°, allowing you to remove the tiller and attach other implements to the PTO – the machine then runs backwards. Pictured on the top with a tiller; on the bottom in reversed position with a sickle-bar. The machine alone costs $2,100.00; the roto-tiller and sickle-bar for this model are each $495.00. (Ferrari, 6104 Avenida Encinas, Carlsbad, CA 92008.)

Also from Italy is this Goldoni Model 224. It has 27 hp and costs $4,695.00. (Smallest engine is 21 hp, largest is 42.) Air-cooled diesel engine (2 cylinders, 4 cycle). 4-wheel drive, only 31" - 44" wide (depending on tires), and articulated in the middle – see photo – for tight turning. (Western International Sales Corp., 3077 Teagarden St., San Leandro, CA 94577. This company also handles a complete line of Lamborghini 4-wheel drive tractors, the smallest of which is the Model 235, with 38 hp.)

As far as I could learn, no American tractor manufacturer uses air-cooled diesel engines; yet several European companies do, and have for many years. The first one was built in Germany in 1942. One salesman told me that high mineral content in European water, and poor quality water, was hard on water-cooled engines, and was a big factor in developing air-cooled diesels. Their main advantages seem to be:

- a simpler engine, cheaper to build and easier to maintain. No radiator or water circulating system (lighter weight), no rust or freeze-ups.
- works in a wider range of temperatures; will start at -30° and will run cooler in hot weather than water-cooled diesels.
- faster warm-ups. Ready to go under a full load in 5 minutes, instead of the 20-30 minutes it takes a water-cooled diesel to warm-up. This, plus the fact that there is no cooling fan to pull, means less fuel consumption.
- cleaner exhaust and lower noise level than gasoline engines.

When I asked the salesmen for American tractors what was wrong with the air-cooled diesel engines, their main objections were that it was an easier engine for an inexperienced operator to ruin. For one thing, the engine can burn up if dust and straw clog up the air circulation; this is less likely to happen with a sealed water-cooled system. And since an air-cooled engine has a wider range of operating temperatures, and must be built with greater tolerances in the engine, things tend to knock around a bit when it's cold. Running any kind of engine too hard when it is cold will shorten its life, but this seems especially true of the air-cooled diesel.

Kubota, from Japan, makes a full line of 4-wheel drive water-cooled diesel tractors. Pictured is the Model B6000C, which with 12.5 hp is the smallest 4-wheel drive tractor currently on the American market. It costs $2,945.00. (Kubota Tractor Corp., 300 West Carob St., Compton, CA 90220.)

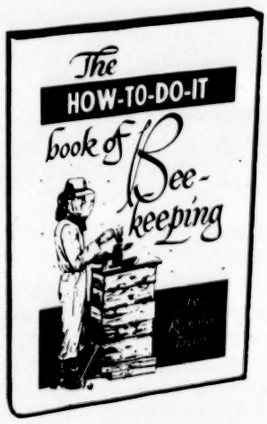
One way or another, American farmers will probably be seeing more Japanese tractors. For example, the small Ford farm tractors (the 1000 series) are all made by Ford of Japan. Two other Japanese tractor makers were at the Tulare show, both with small tractors. They are: the Yanmar (water-cooled diesels, write to: Gearmore Inc., 1300 66th St., Emeryville, CA 94608), and the Satoh (gasoline, write to the National Equipment Distributors Association, P.O. Box 5025, Richmond, VA 23220, for the nearest dealer.) ■

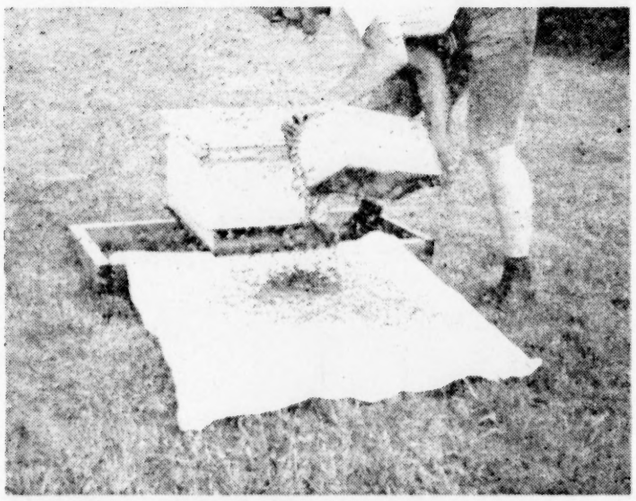
The How-To-Do-It Book of Bee Keeping

Dr. Taylor, philosopher and beekeeper, covers many topics that are neglected by others. He doesn't waste space introducing the reader to hive parts, bee terms and other information that may be gotten elsewhere, instead, the entire book is devoted to answering specific questions relating directly to the practice of beekeeping. A glance through the contents and one may find the section to answer questions from how to act around bees to how to avoid extracting unripe honey. Not being connected with any bee equipment manufacturers, (as most other bee authors are) Dr. Taylor also tells how to make some of your own equipment.

— Jeffrey Lewis

The How-To-Do-It Book of Bee Keeping
Richard Taylor
1974; 134pp.
$2.95 postpaid
from:
Walnut Press
Naples, NY 14512
or Whole Earth





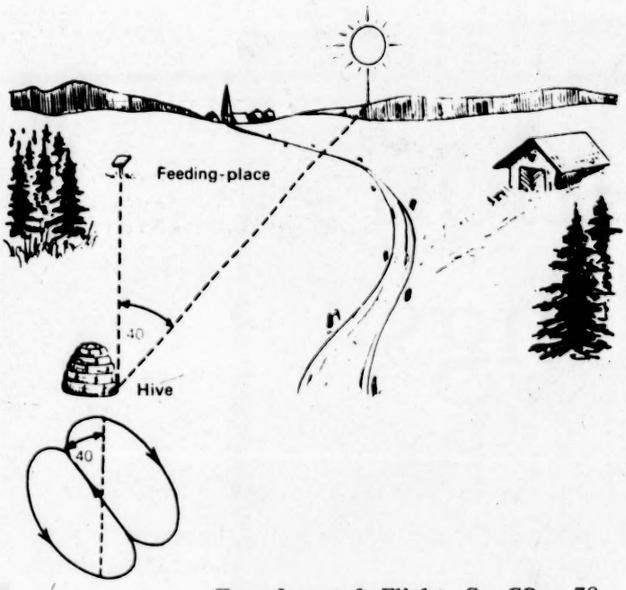
Hiving a swarm from a swarm box.

Swarm gathering with funnel and box.

The true bee master's work in the bee yard is always deliberate, concentrated, without wasted motion, and without mishap yet not slow. He knows at every instant the exact mood of the bees. He knows exactly when and where a puff of smoke is needed and he does not use it excessively. He seldom gets stung, though his attitude to stings is one of total indifference.

•

Persons of pioneer spirit who can be content with simplicity can gain their livelihood, or at least the basic part of it, in this way. One strong man can do the basic work for about three hundred colonies. The investment is not great and can be made gradually over many years. The beekeeper may achieve a very precious independence in this operation. Since his operation is less extensive, so are his headaches. Unlike the large commercial beekeeper, this one can be an apiarist in the fullest sense, relying on his skill rather than sheer size. He can find time to enjoy his craft, in contrast to simply overseeing an enterprise.



From **Insects In Flight.** *See* **CQ** *p. 78.*

Sketch of direction-finding and the conveyance of directional information by the honeybee Apis mellifera. *If the bee finds that the direction of the feeding place makes a horizontal angle of 40° to the left of the sun (the sun's height in the sky is irrelevant), then subsequently the bee dances on the vertical comb in such a manner that the straight centre track of the dance pattern is at 40° to the left of the vertical. The bee has converted the angle into different terms of reference, a gravitational system, because the sun is not visible inside the hive. Primitive bees of the species* Apis florae *live in the open and only dance on horizontal surfaces and directly in relation to the sun; they do not transpose their co-ordinates. The honeybee itself occasionally dances on the alighting board of the hive, and can easily be made to do so inside the hive if the comb is turned to a horizontal position. Still more primitive genera of bees do not dance at all but induce other bees to fly after them directly toward the food, or else mark the route every few metres by scent-spots on the ground* (Trigona postica). *It is reasonable to assume that the 'evolution of bee language' has taken place from such primitive ways of conveying directional information up to the complex transposition system of the honeybee, the most highly organised community of any insect.*

Freebeez

A lot of people are getting into bees. This year, more than ever, they're finding that that costs a lot of money. Here's a way to save $25. per hive and have an interesting experience doing it.

Every springtime there comes a two to six week period known as the "swarming season". A percentage (up to ¾) of an overpopulated colony along with a queen will leave the hive to search out a new home. This is a swarm. A swarm might land on anything – I've captured them on branches, the side of a building, hanging from a porchlight. These exposed places are temporary resting places for the swarm. The bees are waiting for scouts to find adequate shelter. Swarms are usually docile.

Ironically, this miracle of Nature often strikes terror in the heart of the homeowner on whose rosebush it has landed. He will call the fire department, police department, agricultural commissioner, agricultural extension, S.P.C.A. – anyone who might help him get rid of this plague. These agencies will usually refer these calls to local beekeepers who want swarms.

Well, if you've listed yourself with these agencies (and others) as one who's willing to go out and capture these swarms, you're in line for some free bees. Last year I lived in Stockton, Calif. and captured eight swarms this way (8 x $25. = $200.) I could have captured 20 or 30 but I ran out of hives. My phone was ringing so often, I had to pull my name off their lists.

1. List your name with various agencies.
2. Have empty hives available.
3. Have access to a phone.
4. Know how to do it. (It's easy. Consult a beekeeping book, and/or, better yet, a local beekeeper.)
5. Be ready to go. The bees may be swarmed in the open for only a few hours.
6. Have fun. The neighborhood kids will think you're Mr. Wizard.

P.S. I don't know how exterminators handle requests to get rid of bees. But if you contact them, they might refer calls to you. Think of all the positive bee energy you'd be preserving while helping yourself, too. But remember: an established colony in someone's attic is not a swarm, it's a major undertaking.

Peace and Strength,

Don Cambou
Bonners Ferry, ID

Used bee equipment

It is best to know something of apiculture before attempting to buy used equipment. The major danger is of buying diseased bees. The state bee inspector is often very helpful in locating used equipment. He will usually know of bees in your area that are being neglected. It makes his job easier if someone will work the hives and keep all parts movable. Usually he will have a fair idea of chance of disease being present. Often perfectly good hives complete with bees and some honey may be had from old timers who can no longer do the necessary lifting for less than package bees alone. However there is almost always plenty of work involved getting things back in shape. Contact your state bee inspector through your Department of Agriculture.

Cheapest source of mail order bee equipment I know of is: Stony's Cypress Beeware, P.O. Box 212, Homerville, GA 31634. All wooden ware is of cypress which is noted for rot resistance. Rabbit joints are used rather than dovetail joints on supers & hive bodies making them somewhat weaker but they will hold up well if you use a good glue along with nails when assembling.

Some current prices:

Cypress hive stand	$1.50
Cypress bottoms	$1.75
Cypress telescope covers (no metal)	$1.85
Cypress 9-1/8" wedge top frame	$ .19

– Jeffrey Lewis
Middleville, Maryland

**"To bee or not to bee,
THAT is the question."**

– Diana Fairbanks

The Preservation of Old Buildings

BY WENDELL BERRY

For generations now we have persisted in the assumption that we could make a future in disregard of the past — without an effort to preserve what is worthy in our inheritance. This assumption has required the deliberate destruction of an incalculable wealth, both natural and cultural. The destruction has been facilitated by our failure to perceive or to make vital connections between nature and culture. Thus American culture has risen largely at the expense of nature, but our contempt for our once-bounteous natural heritage has persisted as an omniverous wastefulness which has also divested our culture of some of its finest landmarks. Our willingness to squander the virgin Kentucky forests has become our willingness to destroy irreplaceable Kentucky buildings. And these buildings are irreplaceable for want of *both* timber and talent. We have little lumber now that is worthy of a good carpenter, and few carpenters who are worthy of good lumber.

The disregard of the past, or of heritage, that has been our policy for so long is now unarguably bankrupt. Its definitive revelation is in the Nixon transcripts, which destroy forever the illusion that one can be safely ambitious without respect, or legitimately hopeful without historical memory and judgment.

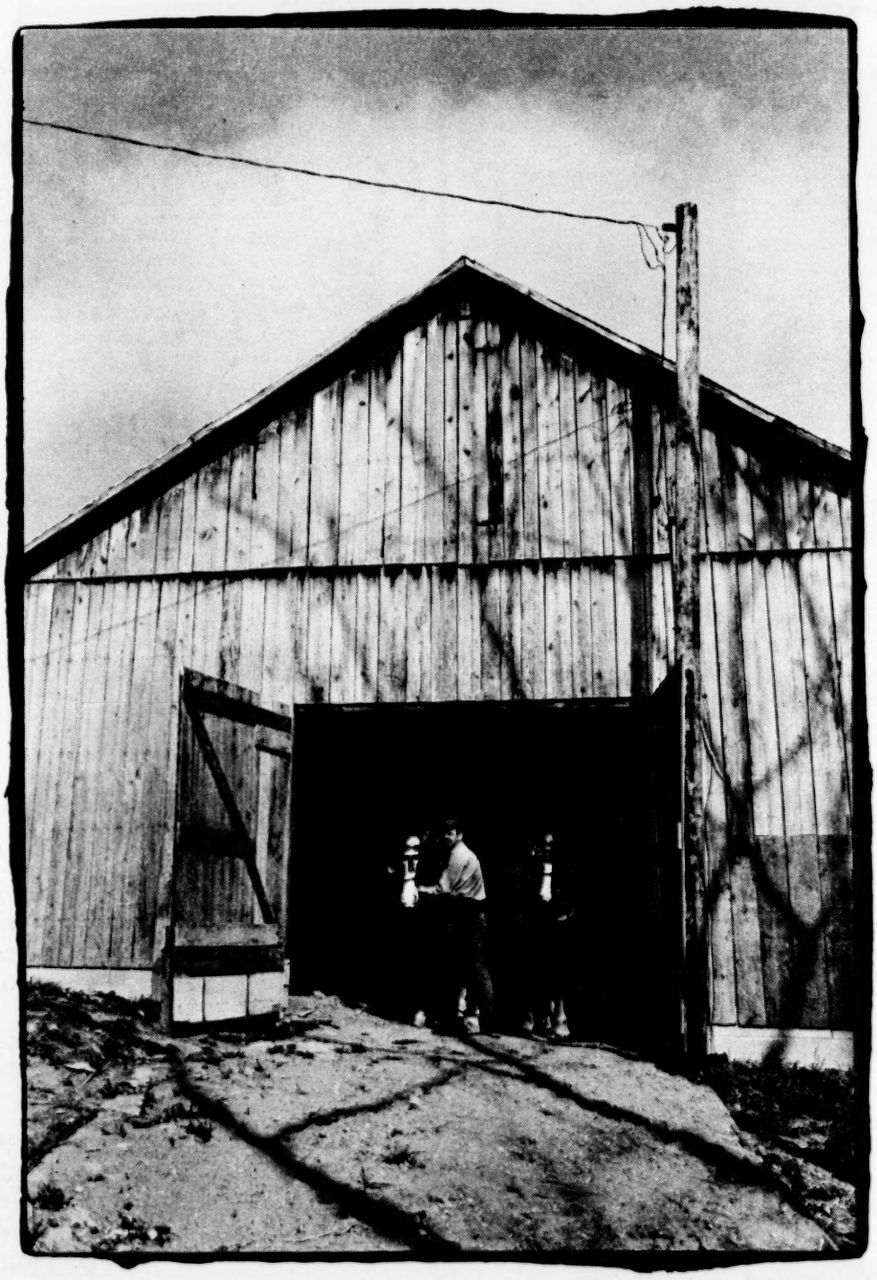
The wish to have a future without a past elects vainglory and deceit to office. It strip mines Black Mountain and Black Mesa. It would dam the Red River Gorge, and build a chair lift at Cumberland Falls. In town after town it has replaced history with a drive-in bank. And always the assumption is the same: what we have been does not matter; all that matters is what we are going to be. The penalty, though, is that the less we know of what we have been, the less we are able to determine what we are going to be. As we lose our memories, our desires become vague and uninspiring. Without a past that we have troubled to define and value and understand, we have no standards for the future.

Obviously, then, I am *for* the preservation of old buildings. I would like to see every one of them preserved, as landmarks, as memorials, as public treasures, as living places — *especially* as living places. But in pleading for their preservation, I want to stress as emphatically as I can the complexity of their value. I am afraid the effort to preserve them will be too simple, and I do not believe that they can be simply preserved.

What troubles me is that the most obvious reason to preserve the old buildings is that they are unique. It can easily be argued that these buildings are valuable precisely because we have not, now, the materials or the skill or the money or the time or the patience, or indeed the wish, to build anything like them. And it can easily be argued that we will *never* build anything like them for the same reasons. But I am afraid that these reasons, that argue in the short run for preservation, argue in the long run for destruction. For time has never been sparing of values or creatures that were *merely* unique, any more than it has been sparing of the merely beautiful. The uniqueness of these buildings imposes an urgency upon our wish to preserve them, but it does not suggest the best reasons. What has survived has done so because it is viable or useful — because its value withstands use.

I am assuming that there can be a use for things that is not exploitive or destructive, and that this sort of use is intricately joined to those considerations that we think of as cultural. If we think of a fine old house as unique — as belonging somehow exclusively to its "period" — then we make a curiosity of it, and curiosities, as we know, are dependent upon curators, curators upon budgets, budgets upon governments, governments upon trust or whim or luck. If, on the other hand, we speak of its *use*, we are speaking first of all of its practical value, but more important — since it is a fine old house — we are speaking of it as a model. If we can see *that* use in the house, then we place it upon the same perennial footing as the other works and tools and values and disciplines that have survived budgets and governments.

The question I have been working toward is whether we are to be tourists or participants in our heritage. I am interested in the question because I believe it is an eminently practical one: I do not believe that tourists can preserve anything, including themselves, for very long. And one of the tragedies of the modern world is that it has made us tourists of our own destiny. It has taught us to turn to the past for diversion rather than instruction. It has taught us to look into



Wendell Berry and the old horse-barn he restored to use on his farm in Kentucky. Photo by James Baker Hall.

our inheritance for curiosities rather than patterns. Our old houses survive — and *can* survive — only by accident in places where they stand as examples to no young builders. They cannot be properly valued — and so cannot be preserved — by people who do not *learn* anything from them. It is a fact, which threatens much more than our architectural inheritance, that we have too many university-trained specialists, who honor the past for its relics, and far too few master craftsmen who might assure the survival of its excellences.

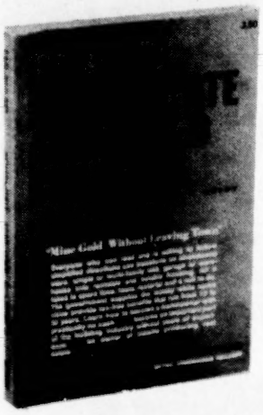
I therefore suggest that, accompanying the effort to preserve the old buildings, or rather as an indispensable part of that effort, classes in carpentry should be started in the high schools, and that the study of these classes should be the best local examples of carpentry and architecture. Whatever is learned in this study should so far as possible be applied in actual work, perhaps in some form of apprenticeship, both in the repair and maintenance of old buildings and in the construction of new ones. Thus several pressing needs might be fulfilled at once. Accompanying such a program should be an effort to salvage and preserve for re-use the excellent building materials now being recklessly destroyed in urban renewal projects. I believe that it is only by such practical measures that the past may again become a living presence in the minds of the young people, who might then convey some of its excellences into the future. ■

How to Rehabilitate Abandoned Buildings

Some of it's basic (floors & toilets), some of it's cosmetic (molding & kitchen layout), but all of it is a big improvement over wreck-and-develop. My neighborhood in San Francisco is commencing to reconstruct itself this way.

– SB

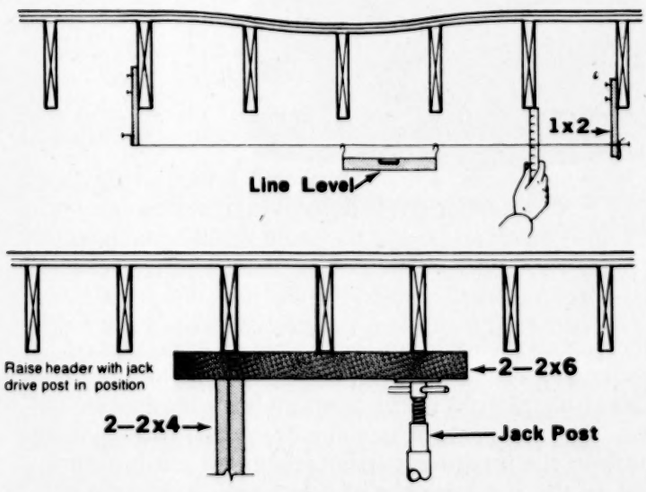
How to Rehabilitate Abandoned Buildings
Donald R. Brann
1974; 258pp.
$3.50 postpaid
from:
Directions Simplified, Inc.
Division of Easi-Bild Pattern, Co. Inc.
P.O. Box 215
Briarcliff Manor, NY 10510
or Whole Earth



In July, 1973, the wire services released stories that told how New York City officials were offering houses at $1.00 each. Their purpose was to revitalize slum areas. With 259 vacant houses in a racially mixed slum, the Philadelphia City Council also adopted what they call an urban homesteading bill. A survey indicates Philadelphia had a total of 30,000 abandoned buildings off its tax rolls, with hundreds more to be so certified.

•

Assuming the house you buy is stripped of its facilities and you recognize the logic of moving in as soon as possible, the question of a workable toilet requires immediate attention. Your choice can range from an old-fashioned bedpan and plastic bags; a chemical toilet, available from lumber, farm supply and mail order houses; a propane gas fired unit, that can be installed below the waste line in a basement. Since a basement floor is usually below frost level, even before you heat the basement chances of a freeze-up are nil.



Only the poor can help the poor.

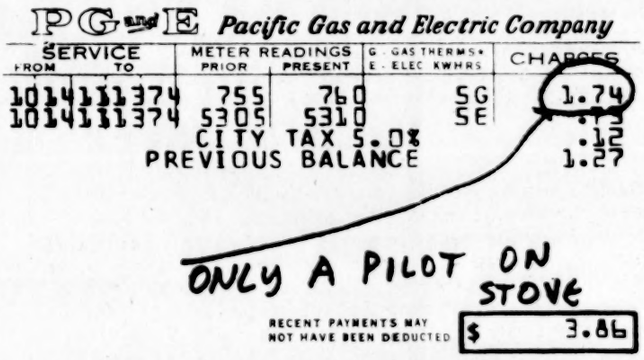
– British saying

Thrifty pilot light

The PG&E bill for my unoccupied unheated apartment shows that the pilot lights on a 4-burner stove cost $20.88 a year in San Francisco. (S.F. is low relative to the rest of the U.S.)

I now use my aceytelene torch igniter. Mine cost $3.25; others cost 60¢; one flint is probably a 1000 lights at 12¢ per flint.

– Michael Phillips
San Francisco, California



How to Install a Fireplace

Most thorough book on the subject. Emphasis on air-circulating fireplaces, which makes house-heating sense.

– SB

How to Install a Fireplace
Donald R. Brann
1974; 242pp.
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Division of Easi-Bild Pattern Co., Inc.
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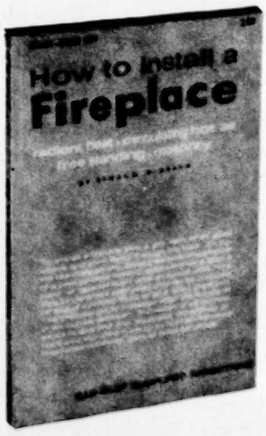
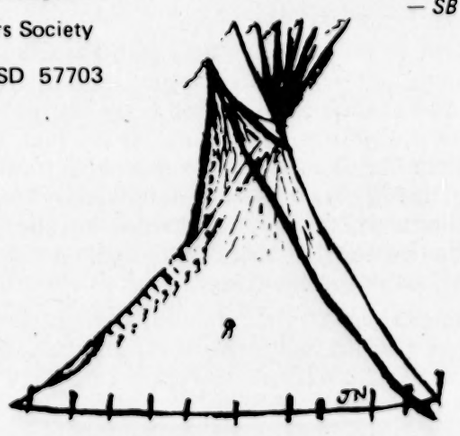


Lodge Owners Society

Tipi buffs network. No dues. 100 members so far. They tell us there were 324 tipis at Crow Fair (Crow Agency, Montana) last August.

– SB

Lodge Owners Society
Box 7
Rockerville, SD 57703



Suntek

Day Chahroudi – an old cohort of Steve Baer's at Zomeworks – and Sean Wellesley-Miller of MIT have teamed up on solar membrane design and started a company:

Suntek Incorporated
33 Edinboro Street
Boston, MA 02111

Solar membranes are two or more layers of long-life transparent fluoroplastic held a fixed distance apart, making an insulated transparent large-area skin for greenhouse, home, or whatever.

Suntek concerns itself with designing the molecules of the membranes, the structure systems holding up the skin, and integrated "bio-shelter" human-plant-energy systems.

– SB

Currently, we are working on a thermostatic "cloud gel" backing for the membrane that turns opaque white when the interior air exceeds a preset temperature level, effectively rejecting unwanted solar radiation and heat. Its behavior is regulated by two variables introduced during the manufacturing process: the thickness of the gel and the temperature level that activates it. It is, for example, possible to manufacture a square foot of this material that turns opaque at 75 degrees F. and transmits 4 percent of incident sunlight. Or a section may turn white at 85 degrees F. and transmit 10 percent light. Combining panels of different thicknesses and temperature settings will allow very sensitive climatic control, without (or with minimum) mechanical intervention. Using a material such as fluoroplastics, which are the least flammable and most durable of plastics, would produce a membrane lasting 30 years.

•

One BTU in twelve of the global energy production is used to heat or cool an American building.

•

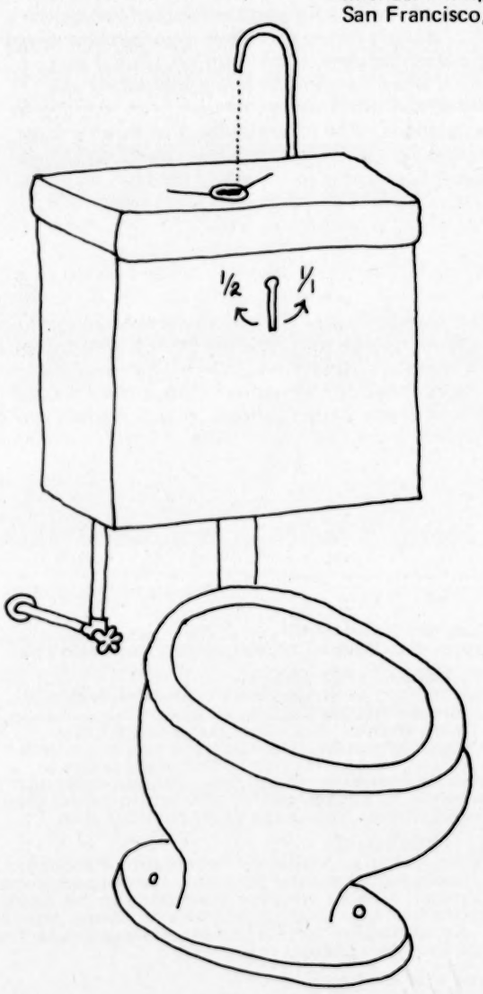
Perhaps we will see the emergence of a new regional vernacular based on local climate and materials and so possessing distinct structural characteristics, style and layout. A solar architecture, with genuine roots, that knows where it is; that does not assume that, given a bulldozer and an adequate supply of mechanical air conditioning equipment, any one site can be reduced to the equivalent of any other; that does not need to pilfer the past for stylistic certainty, nor preempt the future for power.

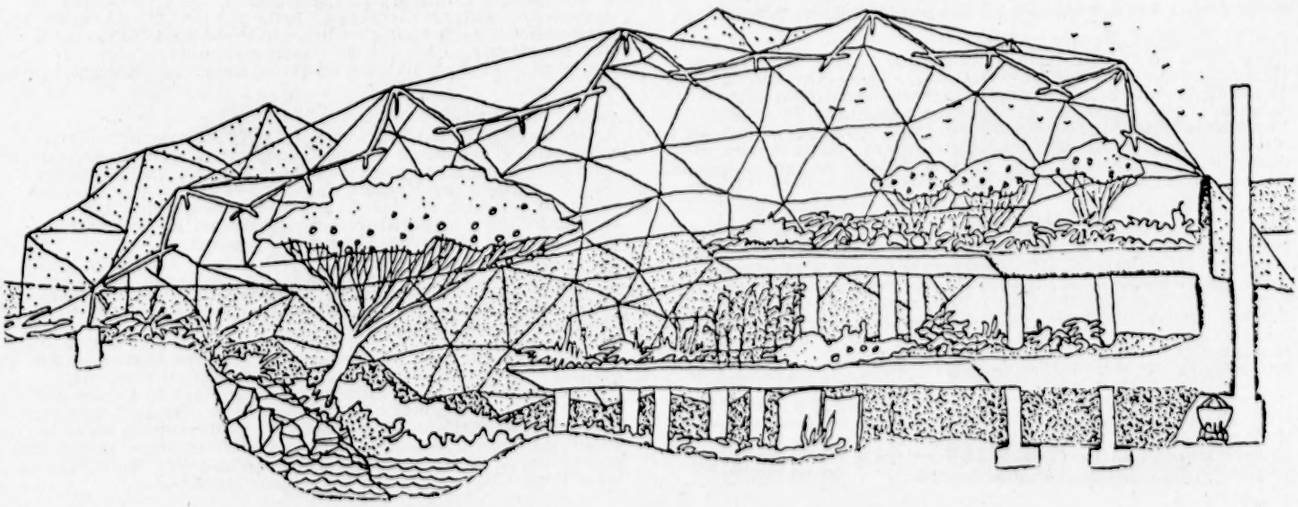
From "Bio Shelter", **Architecture Plus**, *January 1975.*

Japanese toilets

Great idea on toilets to save water: I saw it many places. It has apparently been around since post-war (see drawing). A different amount of water is flushed by moving the hand flush lever to left or right (piss or shit) and the new water coming into the tank is used to wash your hands. . . Only 17% of Japanese toilets go into sewerage pipes. Of the rest, nearly all goes into cisterns for pick-up as fertilizer. Most magazine and second class mail paper is recycled, especially high gloss paper; paper has been picked up in the home for many years.

– Michael Phillips
San Francisco, California





Soft Technology

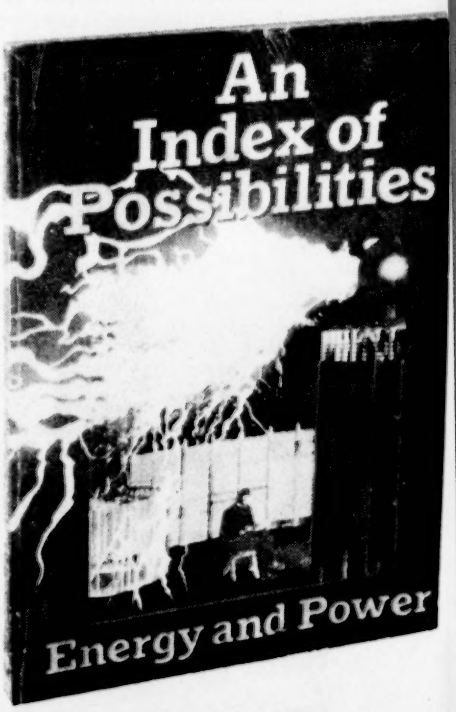
(By Doug Dylla)

An Index Of Possibilities (Energy and Power)

A catalog of ideas and beliefs, conjectures, "readable scientific apocrypha," and "did you realize that people are doing this?". At first I thought this was yet another hippy-dippy undocumented generalized turn-on. But it isn't. I keep reading it when I should be doing something else. I keep finding out about things that I have been wanting to find out more about. The information is admirably cross linked, enabling you to voyage through a number of disciplines as you follow a chosen theme. This tends to encourage you to synthesize unusual combinations; something that more formal books actively discourage or even prevent. They recommend you use the excellent index thus: ". . . stab blindly with pencil, machete, finger or letter opener; move to the page indicated." Universe, Earth, World, Body, Mind, God, and Fundamentals are the main chapter headings. The approach ranges from strict scientific (with appropriate technical formulas and definitions), to metaphysical and even utterly mad (probably). Fascinating! This is the first of a series too, which is good news indeed. A U.S. edition will be out later this year from Pantheon. Now, if you'll excuse me . . . .

— J. Baldwin

An Index of Possibilities (Energy and Power)
by "The Catalogue"
1974; 292pp.
$6.00
(2.50 pounds)
plus shipping
from:
Wildwood House Ltd.
#1 Wardour Street
London, W1, England



A.C./D.C. WAR
Being the Story of the Struggle between two Inventors who Wanted to Electrify a Continent . . .

Thomas Alva Edison (1847-1931)
Born — Milan, Ohio. At 12 became a railroad newsboy. Responsible for the first newspaper published on a train — the Grand Trunk Herald. A stationmaster taught him telegraphy; began inventing. His electrical career centred around the Edison Lamp. He was no scientist, rather a businessman with visions of an empire. Planned to supply electricity directly to homes, and in 1922 set up power plant and HQ at Pearl Street, New York City. The DC man.

Nikola Tesla (1856-1943)
Born — Smiljan, Croatia. Visionary cybernaut. Fascinated by electricity. Had unusual mental powers — photographic memory, instant recall; able to visualise inventions in his head, mentally testing out components before even using pencil and paper. Emigrated to the US in 1884 after working for Edison Co. in Europe. The AC man.

Act 1, Scene 1: Pearl Street
Tesla applies for a job with Big E. Within a few weeks he has worked out plans of how to save Edison thousands of dollars through modification of existing dynamos and motors. Edison promises him $50,000 if it works. It does. Edison gives Tesla a $10 a week rise. Tesla walks out the same day.

Act 2, Scene 1: Border Incident
Tesla finds many of Edison's rivals eager to give him work. He designs arc lamp for street lighting. This is not only a better light source, but is also in direct competition with Edison. Tesla's business partners are delighted. They offer him 50% interest in the company profits. However, this does not give him a voting interest on the board. He is sacked, and discovers that all profits have been reinvested in raw materials. Broke and on the streets.

Scene 2: Rags to Riches
The Depression. Tesla digs ditches for a year. One of his co-labourers, an ex-broker also fallen on hard times, offers to arrange a meeting with an old financier friend, a Mr. Brown. Tesla meets him and explains the advantages of the AC system. Within five hours he finds himself director of the Tesla Electrical Company, with his own laboratory. It was a Saturday. By the following Monday he had found his HQ. It was on South Fifth Avenue, New York City — just three blocks from Pearl Street.

Scene 3: Reinforcements
Here Tesla works night and day — patenting 25 new inventions within just a few months. This tour de force leads to an invitation to speak at the American Institute of Electrical Engineers in May 1888. It is a triumph.

Act 3, Scene 1: The Alliance
Tesla was aware of the commercial aspects of his work but he was not interested in pursuing them. Approached by George Westinghouse, who owned the only electricity company outside the control of the Edison Empire. Westinghouse offers Tesla $1 million for all his patents, and a royalty of $1 per horsepower. Work begins on construction of Tesla's AC motors. Tesla is still inventing furiously. Discovers the Tesla coil, an extremely efficient high-frequency transformer. Begins to work with higher voltages.

Act 4, Scene 1: Counter-Attack
Edison and his shareholders are faced with bankruptcy if Tesla's systems prove a success. Their solution is cunning. It comes in a letter to George Westinghouse requesting permission to install Tesla equipment for a project in upstate New York. Though suspicious, the offer was financially tempting enough for Westinghouse to accept. Then came the payoff. Edison revealed his project to be the construction of the first electric chair in Sing-Sing. He aimed to demonstrate to the minds of the public that AC kills.

Act 4, Scene 2: Fighting Fire with Fire
1893. Chicago's World Fair, called the Columbia Exposition in honour of Columbus' 400th anniversary. The first major event of its kind to use electricity — all AC, supplied by the Westinghouse Company. In addition to the cornucopia of devices and gadgets displayed, Tesla put on his own show of magic tricks, performing with his beloved electric current. For the climax of his act, he passes one million volts of electricity through his own body, to show that AC need not kill.

Act 5, Scene 1: The Falls
A few days after the World's Fair, a newspaper announces a competition organised by the Cataract Construction Company, who are offering $3,000 prize money for the most practical plan to harness the Niagara Falls. Tesla and Westinghouse sit it out until all the entires have been submitted and rejected. The competition is dissolved and Edison and Westinghouse are invited to submit tenders.

Act 5, Scene 2: Denouement
No DC system can handle the energy of the falls, which is estimated at between four and nine million horsepower. Edison leases AC equipment.

Finally, in 1895, both companies agree to participate in the project — Westinghouse to build the power stations and Edison to handle the generated current. It is to be the greatest feat of engineering the world has seen. By 1896 power is flowing to Buffalo, 22 miles away. This success leads to authorisation for Westinghouse to construct seven additional generating units to supply 50,000 horsepower. They light up New York City.

Energy Primer

Well, it's here at last, and well worth the wait! It replaces (and obsoletes) a whole roomfull of casual articles and "free energy" books. In their place is a really impressive collection of information arranged for easy use. Under the headings of Solar, Wind, Water and Biofuels, the basics are explained and the numbers and formulas are given too, so you can carry your interest beyond mere turn-on. You can go still further in the bibliography which contains even more specialized bibliographies. If you are just getting into "alternative" (what's alternative about the sun?) energy, this book is the best way to find out what's going on. If you are already working, even as a professional, you'll likely find stuff here you haven't heard about.

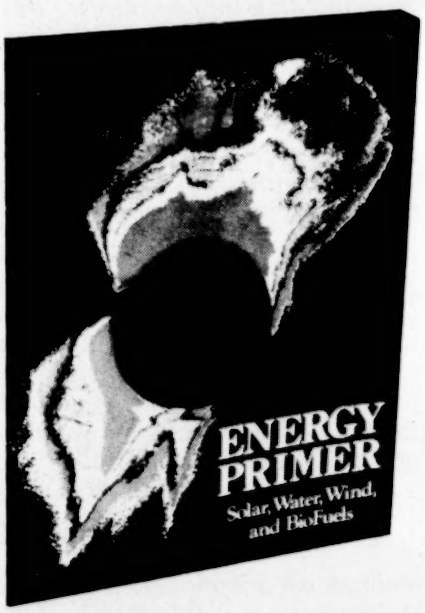
One problem with a book like this is that it quickly becomes out of date. The problem is solved nicely in this case by means of the Alternative Sources of Energy (ASE) Newsletter which is part-sponsor of the Energy Primer. (EPILOG p. 538) (now $6.00/yr). They will serve as the feedback loop and latest development reporter, thus starting an information exchange that has long been needed. A good idea beautifully done, and another door opened.

— J. Baldwin

Pretty popular book. The first printing of 10,000 sold out in two weeks.

— SB

Energy Primer
Richard Merrill,
Thomas Gage,
Chuck Missar,
James Bukey, eds.
1974; 200pp.
$4.50 postpaid
from:
Whole Earth Truck Store
558 Santa Cruz Ave.
Menlo Park, CA
94025



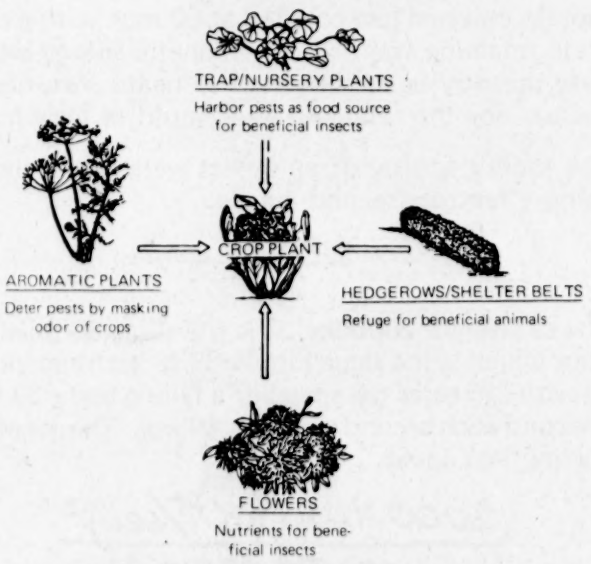
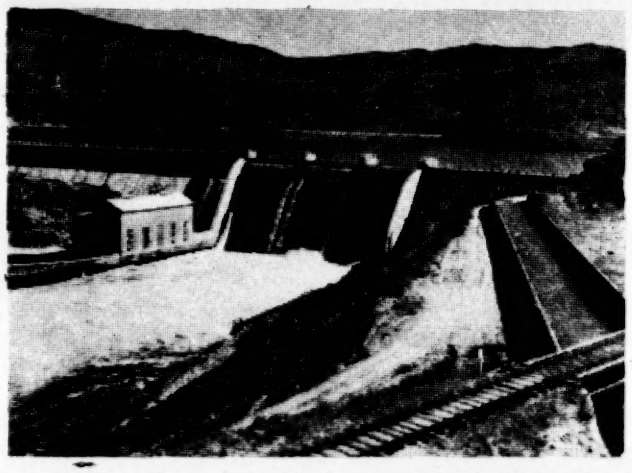


FIG. 4 SOME POSSIBLE COMPONENTS AND PLANT INTERACTIONS OF A DIVERSE CROPPING SYSTEM. Based on a garden model of "companion planting" arrangements.

Sample item from **Energy Primer.**

DESIGN OF SMALL DAMS

This is the definitive text on the design and construction of earth fill dams. The dams discussed and illustrated are medium sized or large by most standards. With considerable information on ecological impacts; soil geology, soil placement, construction techniques and the like this book has become part of the reference library of most civil engineers working in the field.
—Robin Saunders



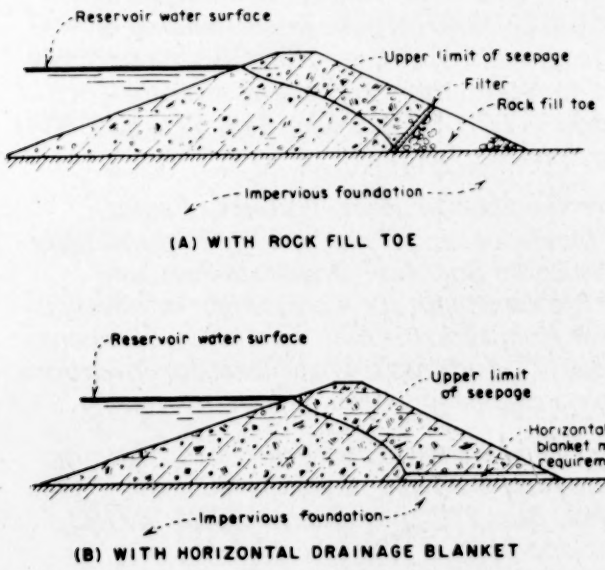


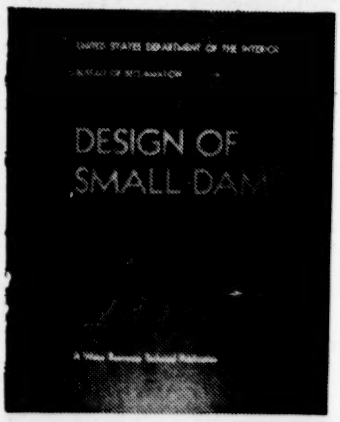
Figure 114. Modified homogeneous dam.

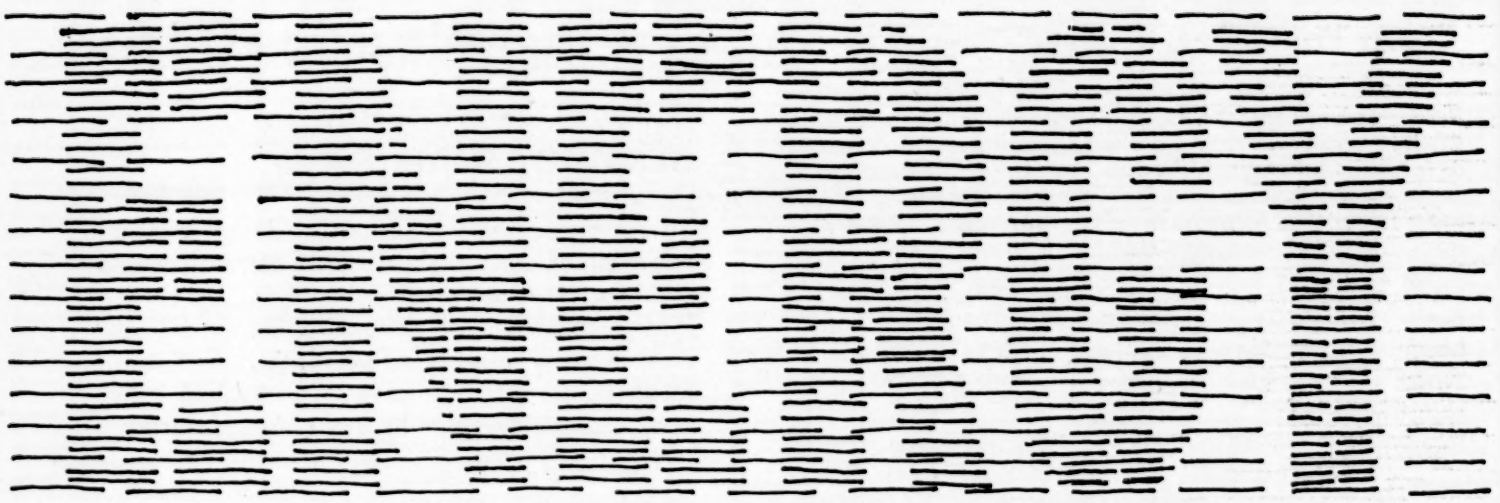
Design of Small Dams
Dept. of the Int.
1973; 816 pp

$12.65

from:
Sup't of Documents
U.S. Gov. Printing Off.
Washington, D.C. 20402

or WHOLE EARTH TRUCK STORE





BY **STEVE BAER**

I think some people hoped that "Energy" would be a fad. We would all be concerned about it, learn a thing or two, up the pressure to make a few adjustments, they would be made slowly, and we could pass on to other concerns. But that's not happening.

Instead we're in the process of reorganizing the whole damned culture around different energy-collection, valving, and accounting. And we're hindered in making those changes by poor understanding of energy's most basic qualities. That's what keeps me attending to Steve Baer, successful inventor (Zomeworks – EPILOG pp. 528, 529, 531, 532, 534) and energy philosopher.

Characters like Specific Heat, Turbidity Factor, Angle of Incidence, and Dewpoint live as thoroughly for Baer as Bored Socialite, Desperate Poet, and Vengeful Brother might for a playwright or novelist. That's their fluidity in his mind and his involvement in their reality. And that's what makes for inventions which have a chance at working, with practice.

The stories here are excerpted from a forthcoming book, **Sunspots**, *available soon for $3 from Zomeworks, Box 712, Albuquerque, NM 87103. They first appeared a couple years ago in an Albuquerque underground paper* **The Tribal Messenger**, *with the following introduction by Baer.*

– SB

"Skip stopped by Zomeworks and asked if someone, perhaps Day Chahrohdi, would be interested in writing a technical piece to follow their last article. Day wasn't around so I quickly recommended myself and as I was doing this a bigger scheme appeared to me. I have been trying to write a book about solar energy for some time, I even have some chapters mostly completed. Why not write a chapter for each issue of The Tribal Messenger-- it could be an informal first draft. After the first draft in The Tribal Messenger I could revise it and publish it as a book.

I don't have the time, ability or the patience to write really good books. I offer as evidence the two books I have written -- Dome Cookbook and Zome Primer. But still who wouldn't like to think of himself as an author? Besides-- look at the kind of stuff people read. So why not? Skip is for it, and he is the editor. And if the pieces I wrote are not for you-- well, it isn't as if we sold you a roof that leaked or a car with a bum transmission."

ENERGY IN A CAR CRASH

Mechanical energy seems pathetic when it subsides to thermal energy. If you came upon a smashed automobile that had just collided at 60 mph with a concrete retaining wall, all of its kinetic energy would have recently been converted to heat. Yet, niether the car nor the retaining wall would be very hot.

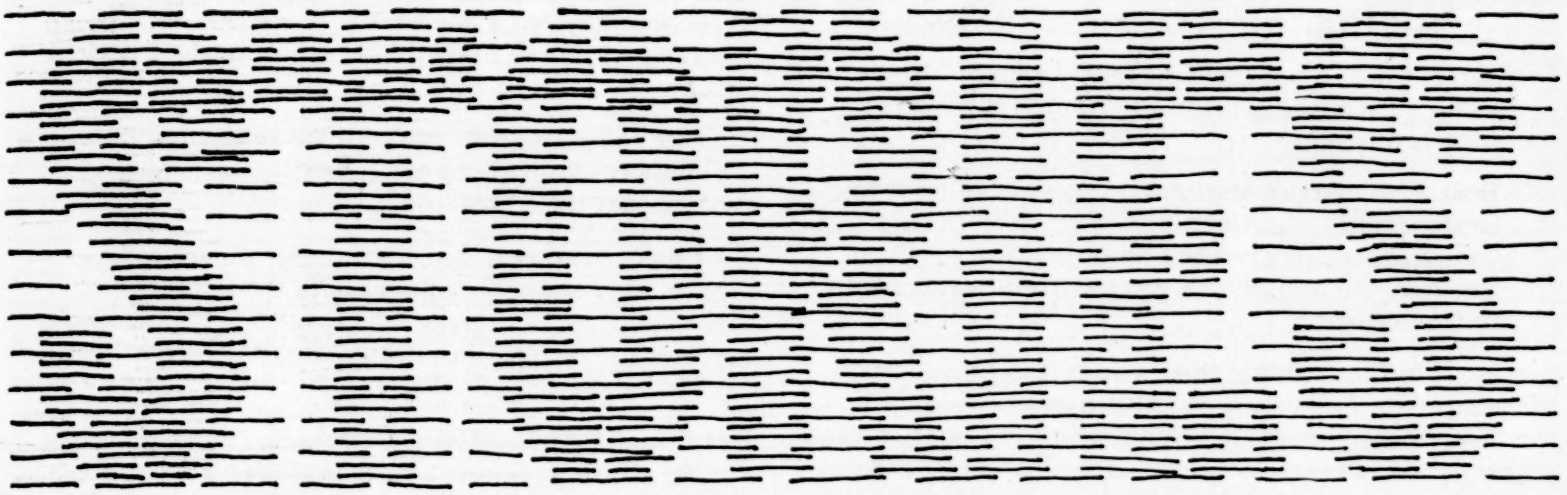
The kinetic energy of an object weighing m lbs and going v feet per second equals:

$$\frac{MV^2}{2g}$$

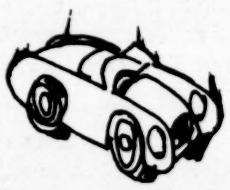
The car weighs 2000 lbs., it is travelling 60 miles each hour which is the same rate as 88 ft. each second. Gravity increases the speed of a falling body 32 feet a second each second that it is falling. The kinetic energy then equals:

$$\frac{2000\ \text{lbs.}\,(88\ \text{ft/sec})^2}{(2)\,32\ \text{ft/sec}^2}$$

242,000 foot pounds 311 BTU's



Illustrations by Russ Youngreen



311 BTU's is very nearly the same amount of energy that falls on a foot square directed at the sun.

The 242,000 foot pounds. We could store this energy by lifting the 2000 lb. car 121 feet in the air.

The 242,000 foot pounds of potential energy then could be cashed in as kinetic energy by dropping the car 121 feet. It would reach a speed of 60 miles an hour just before it hit. When the car hits, the kinetic energy turns into heat.

PORTRAIT OF A GASOLINE DRINKER

Jerry, small, quiet and apparently amiable fellow in his 20's, from Louisiana-- lacked distinctive southern accent.

Boss at the service station on outskirts of large Mid-western city-- at first liked him. Even in cold and wet weather Jerry needed no prompting to go out and man the pumps. He was naturally agreeable to this function.

Early in the morning they would find him at the station in the same soiled blue overalls-- did he sleep there? He lacked the strong body odor of those who sleep in cars and never bathe. When he did not lock up he usually left with the words that he'd stop back by to pick something up.

Eventually the others at the station identified an occasional peculiar and vile odor in the restroom with Jerry, but it was only a suspicion.

It was several weeks before anyone noticed that Jerry, who seemed to subsist on an occasional chocolate bar and never bringing sandwiches or wasting quarters on the large soft drink machine, was actually drinking gasoline.

When one of the other attendants questioned him about this he replied that he "only liked the smell of it."

He generally fed a few times a week and, if he could arrange it, in the mid-afternoon before the 5 o'clock rush.

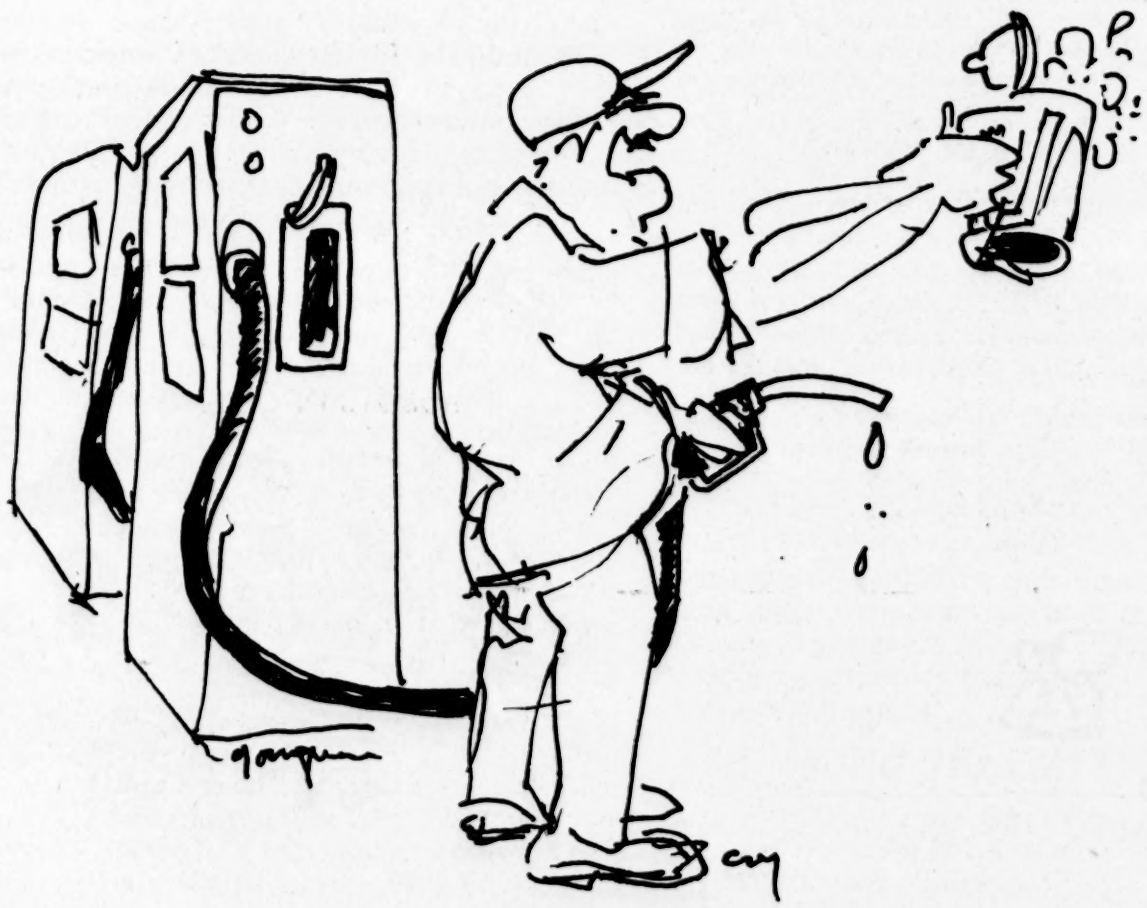
Large expensive new automobiles driven by the elderly-- unlikely to get out of the car and chat or inspect their tires.

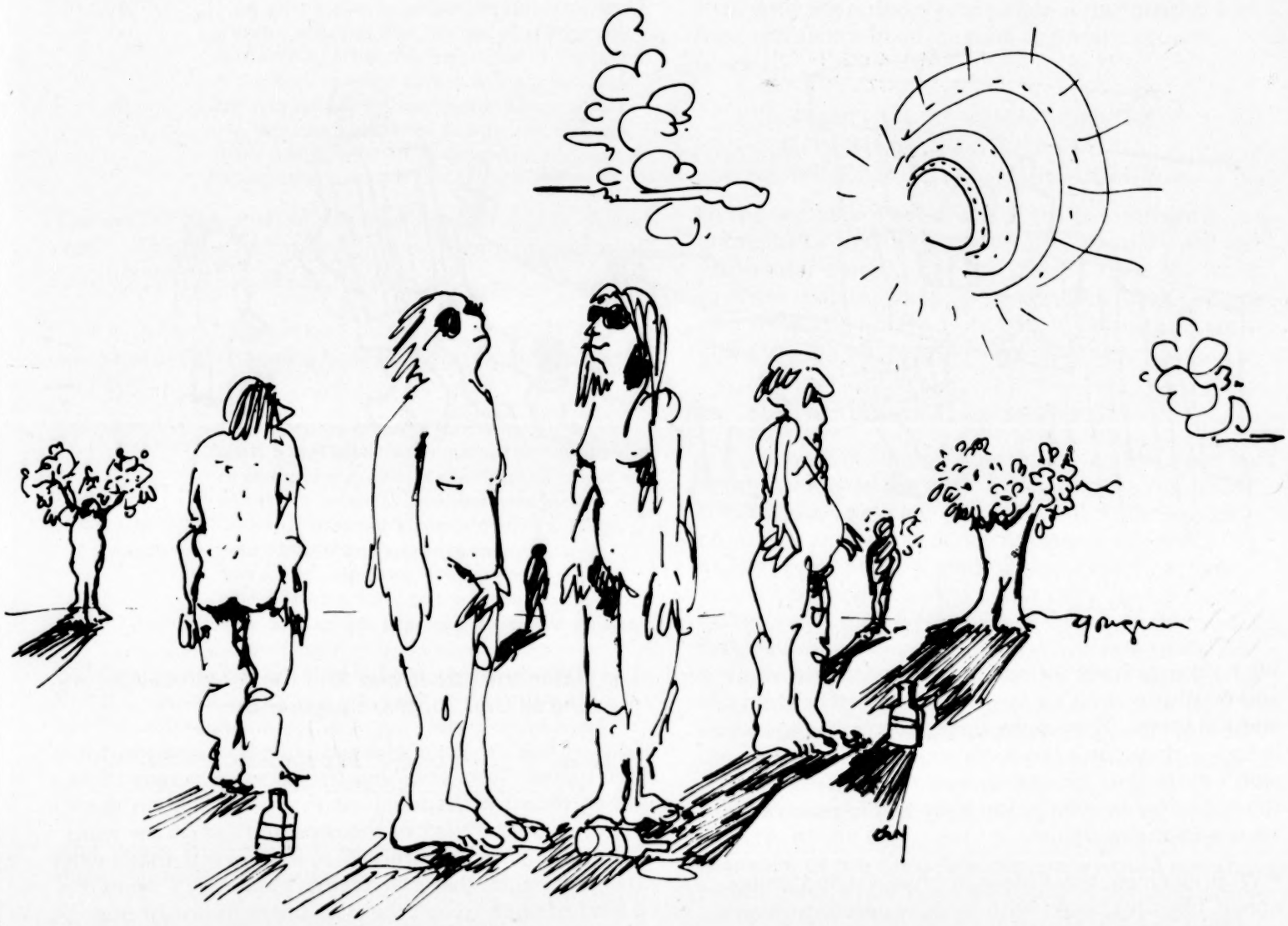
At 4:07 the sun, a red ball through the smoke and haze, only about 8 degrees above the horizon-- temperature 34 degrees F., a large new Cadillac curves into the station from the east entrance-- an old and uncertain driver.

His small bald head within the huge Cadillac like the head of some gigantic reptile whose body grows and grows until it is killed. Jerry knelt in the shadow by the rear bumper, after properly topping off the tank.

He squeezes the trigger again with his left hand spooning the chilly gasoline up with his cupped right hand -- like a man drinking from a stream-- quickly swallowing 7 or 8 handfulls.

Jerry was dismissed from his job. The other attendants had become uneasy about him though he'd only been seen to drink once. His strange pleasantness about the difficulties of the station and the suspicion about the odor others bumped into in the restroom-- a strange mixture of acetone and ammonia. The boss decided he just "didn't fit in."





THE "BASKERS"

Spread it on, the super sun oil, then stand out in the sun—— that's all you need to do. Your oily skin can produce the materials your body needs if you are exposed to sunlight. The ultimate in solar energy devices.

You must practice. The more you use it, the better it works. First week or so it will just take the edge off your hunger. After a year you don't need to eat any more often than a snake. The oil's development is still a little unclear, it seems it was first tested as a weed killer. It is known to be poisonous to plants. And the plants suffer from it all around. Trampled and flattened bushes in city parks, trees with limbs broken off by the oily climbers moving toward the sun.

Yes, a great migration to the Southwest. No, it isn't what you'd call a boom. These people aren't staying in motels or eating in restaurants or building houses or buying much clothing. Of course, the oil is selling great. It's very difficult to know what kind of stand to take about it. Some see it as a cure to mankind's problems. Others have formed vigilante groups to go "hoe weeds," murdering dozens of lethargic baskers. "Damn it Ray, go out and get a job." "Sure Dad."

Later in the day find he's not done anything, just out in the yard, stripped to his shorts. Starting in on the oil.

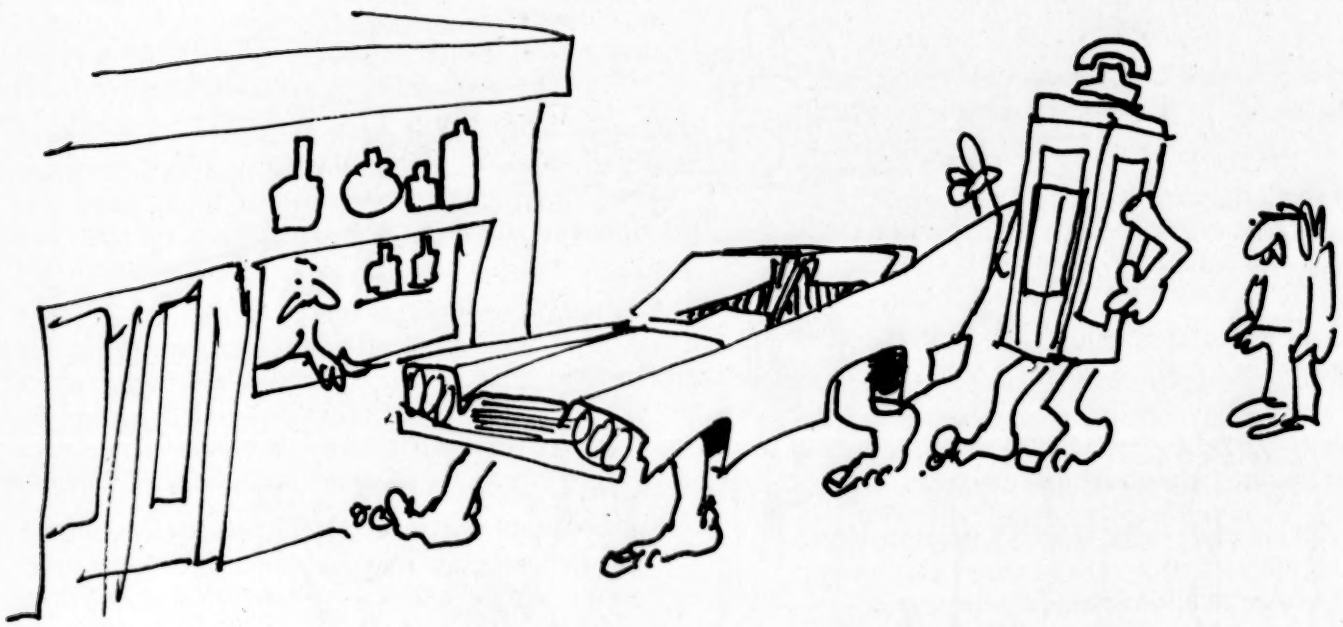
You look close at one of them under a very strong fluorescent light—— and there is a definite green tinge. The only time they ever come into town is during the cloudy weather—— and we'd just as soon not see them then—— all they are doing is waiting for the sun.

ROBOTS IN COMMAND

If you doubt this notice what happens the next time you are in a store and the telephone rings. The customer who has walked in with his head and body is left standing while the business of the person who has called in on the telephone is taken care of. The hierarchy in a drive-up liquor store is usually car, telephone, human.

The equation with its balancing equals sign is a forceful invitation to our minds to jump from one side to the other. Sometimes we later find that a balance existed between relatively tiny aspects of what we believed stood on one side and the other. A story and a wordy explanation are much more trustworthy.

Box 428, Sausalito, California 94965



We hold enormous animals in fields with thin wires and relatively weak posts—— later we gather them and kill them. They never understand what the wire is for—— they don't break through it. The cattle won't move through our flimsy fences. We are just the opposite, we won't stop from leaping each time we see an equals sign.

P.W. Bridgeman, the American physicist and philosopher, filled his books with lengthy descriptions and explanations and very few equations. I quote a passage from his book, **Dimensional Analysis**:

". . . we have treated the dimensional formula as if it expressed operations actually performed on physical entities, as if we took a certain number of feet and divided them by a certain number of seconds. Of course, we actually do nothing of the sort. It is meaningless to talk of dividing a length by a time; what we actually do is to operate with numbers which are the measure of these quantities. We may, however, use this shorthand method of statement, if we like , with great advantage in treating problems of this sort, but we must not think that we are actually operating with the physical things in any other than a symbolical way."

"EXPLORING ENERGY CHOICES"

A Preliminary Report
Energy Policy Project
of the Ford Foundation,
1974
81 pages.

Available from:
The Energy Policy Project
P.O. Box 23212
Washington, D.C. 20024
75¢/copy prepaid

When I glance through a report and see the words "scenario" and "option" repeated endlessly throughout the report, I feel the same kind of horror as when I go out in the garden and find the squash beetles are crawling all over another squash plant.

I know that language changes with the times, but I don't think "scenario" has the necessary credentials for its recent widespread use in reports such as these. No one could object to the repeated use of the word "aluminum" or "fiberglass" in a report. If that's what the material is, that's what it is. However, I think it is a kind of trick to call the possible behavior of our society a "scenario." I thought the Ford Foundation was run by well educated men. Why do they talk in this jargon?

The report is filled with interesting facts and yet, unfortunately, it is not an interesting report.

On page 4, "In 1958 the average American car got over 14 miles per gallon; by 1973 the rate had dropped to less than 12. Fuel consumption and auto weight are directly related: a 5,000-pound car uses twice as much gasoline as a 2,500-pound car. Each model car has crept upward in weight over the years. 1974 "intermediate" size cars, for example, weigh about the same as 1972 "full-size" models."

What's the problem here? If the Ford Foundation is offering us advice and leadership of some sort shouldn't they stop right there, take the millions or billions of dollars that they have, go back to the Ford Motor Company from which they sprang, and direct them to build good cars first and finance altruistic foundations second. That could have been a stirring conclusion to the report. So what if it was only 4 pages long. End of report, end of Ford Foundation.

Throughout the report there is a fundamental misuse of language. It is an affront to a person's common sense to read a discussion where the rate of change of a condition is confused with the condition itself.

On page 39, "Our first scenario, which we call *historical growth,* assumes that the use of energy will continue to grow much as it has in the past. It assumes that the nation will not deliberately impose any policies that might affect our ingrained habits of energy use, but will make a strong effort to develop supplies at a rapid pace to match rising demand."

The underlined portion of the above paragraph should read. . . might affect our ingrained habits of continually increasing our use of energy. . .

This is better, but still not accurate enough. If you are constantly changing how you do things, you have no habits.

On page 41, "*Zero energy growth* is different. It represents a real break with our accustomed ways of doing things. Yet it does not represent austerity. It would give everyone in the United States more energy benefits in the year 2000 than he enjoys today, even enough to allow the less privileged to catch up to the comforts of the American Way of Life. It does not preclude economic growth."

How can someone say that? If we continue to do things in our accustomed ways we will continue to use the same amount of energy. They should have said. . . It represents a real break with our accustomed rate of change of our accustomed ways of doing things. . . .

And, again, how can you be accustomed to something if you are always changing?

On page 45, under the heading Technical Fix Scenario; "A second model of the future offers the option of reducing energy demand substantially below historical growth rates."

An energy demand and a growth rate are different things, just as velocity and acceleration are different things. They should have said. . . A second model of the future offers the option of reducing the rate of growth of energy demand substantially below historical growth rates. . . . And even this isn't fair to the sensibilities of the reader for our recent spasm of growth is not historical growth, it is recent growth.

Why did they write the report this way? Either the authors are stupid or they wish to confuse the readers. I think that it is an effort to confuse. They are trying to instill in people the idea that if they don't use more tomorrow than they did today, they have lost something.

The most remarkable part of the report is the section, Advisory Board Comments, pages 55 - 61. The comments are by D.C. Burnham, Chairman Westinghouse Electric Corporation; J. Harris Ward, Director Commonwealth Edison Company; John D. Harper, Chairman Aluminum Company of America and W.P. Tavoulareas, President Mobil Oil Corporation.

I thought the report failed to explain the problems of growth and was too timid in recommending conservation. The advisory board feels differently. The report ends with the authors receiving a verbal beating for their diffidence in advocating geometric growth forever.

A FURTHER COMMENT ON THE GOVERNMENT'S GRANTS TO UNIVERSITIES AND INDUSTRY

In the last issue I wrote about the government's grants to Universities and Industry to study and develop solar energy. The tone and spirit of the work of those with grants is very much like what I imagine you would find if the Ford Motor Company were given the job of studying Chevrolet cars.

IMPARTIAL TESTS

If Ford were given the job of studying Chevrolet cars and reporting to the american public the results of their study, I am sure that many men, test drivers, comfort experts, efficiency engineers, longevity experts would be assigned to this project. A large amount of money would be set aside for this serious question. If they were given the position of impartial tester I am sure they would play the role to the last serious words of their last expert. What would they discover? That the Chevrolet was a piece of junk that should be dismantled, garaged, or burned? No, of course not. The reports carefully worded by committees to strain out any nuances of individual opinion, would find great promise in many of the features of the Chevrolet. In interviews some of the members of the Ford research team would nod their heads, "Yes, in 20 years we feel that the automobile industry will definitely be ready for the Chevrolet. For clearly many of its features are beneficial and much needed by the public" and, sir, can you tell us what you have chosen after your long study of the Ford and the Chevrolet. "Well, Hal, with today's options in the automobile field, I'll have to say that the car I have found to be feasible is the Ford. Though, of course, I'll grant you that someday my kids will probably be driving Chevrolets."

For some reason, this brand of shit works quite well on the american public.

THE EARTH IS AN ORANGE AND THE SUN A GRAPEFRUIT?

I have always found it difficult to imagine the earth as an orange moving around the sun which is a grapefruit, the orange spinning as it moves. How could our world, which all of us who live on it can see is flat, be, instead, like an orange? Faith in science, geography, Magellan and the shadow you see cast on the moon as the earth eclipses it. And how could the sun which all of us can see is a tiny spot this big

(if your eye is 14 inches from this page) be the big yellow grapefruit?

Perhaps this was the first trick of science—— if you can soften people's brains to where they will say the

earth is round instead of what obviously appears to them when they step out and look at it, then they are ready to believe anything. (I owe this observation to Clark Richert who has often brought up the point that the earth is flat instead of round.)

23½ DEGREE TILT

The table lists approximately how far above or below the equator the sun is on each month:

Jan.	20	-20 degrees
Feb.	20	-11 "
Mar.	20	- 0 "
April	20	11 "
May	20	20 "
June	20	23 "
July	20	21 "
Aug.	20	13 "
Sept.	20	1 "
Oct.	20	-10 "
Nov.	20	-20 "
Dec.	20	-23 "

You can see that the sun lingers at its highest position, hardly changing in the sky for two months, then rushes through the fall towards winter where it will again linger.

The sun follows a giant spiral in our sky. Each day it cuts a new thread winding its way up or down. The threads are closest together at the sun's upper and lower limits and farthest apart midway between.

Almost anything that fluctuates between two extremes lingers at the extremes and rushes between them.

THE SUN RIOTS

The chief of police in a southwestern city is talking on the telephone to the city maintenance department —— "I want reflective blinds on every god damned window and if you can't get enough of them then tape tinfoil over the rest of the windows, now! Before that damn sun comes up again."

The bottom offices of City Hall and the police department have been gutted by fire—— black streaks surround the windows which are now opaque and shiny with aluminum foil. The police are still unable to confiscate mirrors, the matter is in the courts.

A week earlier at a demonstration a large van driven next to the crowd—— the driver, a swarthy man of about 40, opened the back doors and began passing out foot square mirrors. "Give 'em some sunshine!"

A few dozen mirrors began playing beams of sunlight on a police car that had been dogging the rear end of the demonstration. The officers were caught by surprise. The driver managed to back the car down the street, but not before his partner, panicked by the glare and the rapidly rising temperature, had jumped out and run. More and more mirrors were out in the crowd now. The crowd glinted like a bank of crystals. It couldn't reach the police car which had found protection behind a drive-up liquor store. The man with the van now stood on top of it. An old bread delivery van, "Let's burn it up. Yeh—— this."

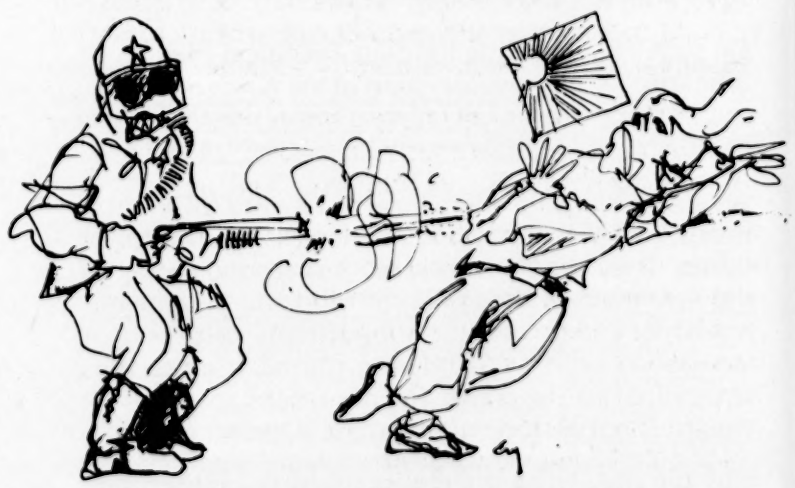
His voice is hoarse and breaking. A few mirrors flit across the van and the man on top. More focus on the tin side. The man climbs off. People are pulling the last mirrors from inside the van as others begin to focus on it. There are 800 mirrors out in the street.

The crowd is silent. The blob of brilliant light on the side of the truck is fringed with trembling squares of light flitting in and out of the target. You can hardly hear a noise. Then the sheet metal side of the van oil cans as the metal swells. A few more moments and smoke appears—— the crowd has results. That was at 11:00 AM, by dark there have been 100 fires.

No one on foot has been burned—— too hard to follow a man on foot. Rows of smoking cars—— the ashes of a flag at City Hall.

It's the office buildings—— the windows above the street—— the crowd focuses through one window after another—— the curtains go fast.

The police appear with arc welders masks. They fire on the demonstrators. The demonstrators disperse, but the light keeps coming. More mirrors appear on the street—— funny shaped mirrors, mirrors with ornamental frames, tiny pocket mirrors in the hands of children.



Smoke is seen from another part of town.

Television crews arrive. The footage in the evening news across the nation is over exposed. An occasional clear image and then the picture goes white and over-exposed.

The mirror crowds are completely silent—— moving everywhere on foot. A secretary at City Hall, "They just looked so funny—— a whole crowd of them standing just as still as could be holding on to those mirrors and then pretty soon the store across the street was burning."

"When they started coming our way they just glinted and shined like a drawer full of diamonds—— when

they steadied down again we got out of there fast because they were burning up Capt. Garcia's office downstairs."

"Get those damned kids with the mirrors off the street."

"But officers, I'm just usin' this mirror 'cause I'm combin' my hair, no law against combin' your hair is there?"

Dozens of youths in the street combing their hair peering into gigantic foot square mirrors.

SECOND SUN

Recently the government gave AD Little a grant of $200,000 to study and evaluate the plan of Peter Glaser to orbit a large satellite which would collect solar energy away from the inconsistancies of the earth's atmosphere and the inconvenience of night time, and would beam the energy back to earth as microwaves.

Certainly it is an ambitious scheme that would require much ingenuity and dedication to succeed. I wonder if the attention given to this plan and now even the money spent on studying it is not very definite evidence that our society has gone crazy. Of course, it's true that if you examine the uses made of modern technology you hardly need further evidence that things are screwy.

What is this really about? Are we that short of energy? Why not burn wood? Wouldn't it be cheaper to build collectors on the ground and accept a little cloudiness and the occurrence of nighttime?

I don't think these projects have anything to do with energy shortages. There seem to be projects which could be the realization of immense dreams.

Once they are spoken about they begin to collect enormous armies bent upon seeing them occur—— here a member of the army contributes enthusiasm, here an arm, here a skillful tongue, here a prodigious ability with mathematics. Once they are going they produce a profound effect on those involved. It is as if the entire world were transformed into a gigantic darkened movie theatre where thousands have conspired together to remove the day to day world—— with its logic, its pleasures, and pains, etc. (cars parked on the street, dirty socks, cumulus clouds, shrubs with dead branches, birds) and instead, project in front of all of them the Big Dream. And it must be good stuff for it answers all problems.

THE DREAM

Why not build a second sun that can beam its energy right through the clouds—— and at night too. Why not build a sun that you own? Think of it.

Why settle for a sun that goes out at night and is interrupted by clouds? Why be dependent on a sun with an uncertain past? Who owns that thing anyway?

Why not build one yourself and know how and why it works? Never mind that it only relays the other sun's energy. Why not have a sun that you can control from a console like a stereo or TV set? That you can turn off and on. Why not make a sun, that would burn up other people if they were bad—— you could decide if they were bad and your sun, controlled by your console, could take care of the rest. Why go backwards in work with solar energy so that you end up like an old farmer farming the sky worrying about the weather. Why not transform the sun itself into a commodity, like a big tank of propane?

BASIC TECHNOLOGY

It is difficult for us to see ourselves in relationship to the machinery, equipment, and gadgets of our technology. What would the Board of Directors of IBM think if they visited their headquarters and found their scientists and business men had abandoned work with computers and instead were engrossed in elaborate yo-yo contests? Our own absorption in our technology, abandoning interest in human and moral problems, is similar to the scientists and business men leaving their jobs to play with yo-yos—— except that our games with technology are perverse and dangerous.

Then what do you do? You try to improve the situation. A problem today is that we are burning our oil and coal at a terrific rate to provide our economy with energy, the end of the supply of such fuels is in sight. Burning large quantities of oil and coal fills the air with smoke—— in many parts of the country you can hardly see. What does one think when he sees energy used to light enormous and hideous advertisements, when it is used to manufacture and transport junk that people most certainly do not need, when it is used by a gigantic military organization which has already perverted the society it claims to defend? Can anyone believe that feeding this sick monster is an urgent task? If someone's body is using energy rapidly to maintain a fever the first order of business is to cure the fever, not to feed it. Our culture is bringing attention to itself crying that it is

almost out of its favorite food. For its health it seems it should eat less and also change its diet. Today it is important for us to find new ways to heat and cool buildings, new ways to move about, less extravagant ways to enjoy ourselves. The answers to energy problems are different for different parts of the country. Some places have abundant sunshine, some wind or geothermal energy or hydraulic power. Other parts of the world are barren of energy sources and must import coal, oil, gas or electricity. One of the most dangerous traits of our government, our engineers and businessmen is the compulsion for single nation or world-wide solutions. Thus a heating system is uninteresting to them if it would have application only in the Southwest. They feel compelled to think big, and working on products for specific local problems is a humiliation. How absurd this is, such thinking would lead a man to refuse to buy shoes since they don't fit on his head or his hands.

The response of our government to the energy crisis has been to pour hundreds of millions of dollars each year into atomic energy research and almost nothing into wind, solar or geothermal energy research. Atomic energy would be the answer if the sun were going to black out, but no one is predicting this. The people doing the work with atomic energy admit that it is dangerous and produces radioactive wastes that must be carefully guarded for hundreds of years. Who will benefit from this competition with the sun?

SCIENCE AND TECHNOLOGY

Our large corporations and the war department grasp science like a bandit with a hostage, "If you are going to attack us, you are also going to harm our innocent friend, science." Many scientists have been only too ready to relax in the grasp of their captor—— confident that no one would risk injuring them. This is very clearly no longer certain. Perhaps it is time to begin throwing rocks at the pair.

ICE

One business that needlessly consumes millions of dollars of electrical energy is the production of ice. It used to be common practice to harvest ice from ponds and rivers, but with the advent of refrigeration machinery this fell out of fashion. We should get back into the business, this time exploiting modern insulation and modern methods of moving materials.

In almost the entire country ice is made with mechanical refrigerators powered by electricity. Here in Albuquerque ice sells for $.03 a pound in blocks, and $.07 a pound crushed. Firewood, hauled from miles away and cut into stove-size pieces sells for $.015 a pound, adobe bricks, cured and stacked, sell for $.005 a pound. It is strange that ice is so expensive. Here in Albuquerque at least six feet of ice can be harvested from shallow ponds or water filled trays during a year. This is over 300 pounds per square foot of pond. If the value of ice were $.01 per pound, each square foot would yield a harvest of $3.00 per square foot or $125,000 an acre. The production of ice with electrically powered refrigerators requires approximately $.15 per 100 pounds of ice so an acre of ice ponds would save approximately $19,000 in electricity each year.

What work must one do to make the ice? One way would be to have plastic trays filled with a hose during the afternoon and to lift off the ice in the morning. During very cold weather two layers could be harvested each day. Some people would object at first to shards of ice from the top of a pond, "Why this looks like it was pulled off the top of a puddle," but eventually users of such ice, if the layers were still recognizable, would realize that the texture of a bag of ice chunks spoke of the severity of the previous winter and it would be as interesting as a bag of oranges. The storage of such an ice harvest is the most difficult part. If the ice were stored in a huge insulated pit, the mass of ice might lose a rind two feet thick during a year as heat travelled through the walls and melted it. An efficient ice ranch would require considerable capital to make the insulated storage, and also an efficient way to handle the daily harvesting of the ice. Think of the difference in the lives of the crews who worked at an ice ranch with its own particular reversed harvesting weather, versus a crew who work in the exact same circumstances year in, year out, handling a refrigeration machine.

There is a texture to reality, good and bad, a mixture of fortune and misfortune. If this texture is presented to people always through other people, machinery or prices, then eventually we become bitter about our own species. If it appears as an unavoidable part of reality, a result of the weather, we do not have others to blame.

Such enterprises as an ice ranch, specifically if the activities were visible to passers-by, are interesting. Cold weather is then useful to someone in a productive way.

SOLAR HEATING

I would count Harold Hay's experiment with a styrofoam ice chest as among the most exciting and illuminating ever done. In Phoenix, Hay filled one of the insulated chests one sees in super markets with water. During the summer he put the lid on during the day and took it off during the night—— the water stayed cool for it was protected from the sun during the day, and at night radiated heat to the night sky. During the cool months of the winter, Hay reversed it—— he opened the lid during the day and closed it during the night. The water stayed warm. Hay later built a small house in Phoenix with a pond of water on the roof, and an insulating cover which could be moved on or off the pond by means of a rope. The house stayed comfortable all year. This is so simple a child can understand everything about it. Hay reported on his work at the 1968 Solar Energy Convention. I was surprised it caused so little excitement. Hay was asked how people would know when to cover and uncover the pond

on the roof during different times of the year. His answer was that people learn when to put on and take off their coats. . . . .

Peter van Dresser, a pioneer in solar heating, has stressed that "sun tempered" rather than solar heated is a more sensible goal in the design of a house. Solar heating versus gas, oil, coal or electricity leads people to expect the same kind of performance from the sun as from a tank of oil or bin of coal. The sun is an unsatisfactory commodity seen along side tanks of butane or oil, or bins of coal. We know that clouds interrupt the sun. During bad weather the sun tempered house grows cool unless other sources of heat such as wood stoves are used. How warm do we need to keep our houses? Sometimes we see ourselves as a brood of prize pigs that we want to feed faster and faster and keep more and more comfortable.

REPTILES NEED MAMMAL HOUSES

The reptile is at a disadvantage because he cannot regulate his body temperature, but, instead, equilibrates near to the temperature of his surroundings. If it is cold he cannot think or move fast. The regulatory function of the mammal was a great advantage since he could keep his body temperature constant. But what about houses and temperature? Is it the same kind of improvement when a thermostat and gas heating system are installed? If the temperature outside one's body, the temperature of the house, is regulated to one-half degree F. of what use is the sophisticated temperature regulating metabolism of the mammal? Obsession with temperature control seems more like Reptile Technology than mammal. The reptile needs it—— the mammal does not. This leads to the general question of what view one should take of equipment manufactured to do for you what your body is equipped and prepared to do for itself. Certainly we are all grateful for the discovery of fire, but the thermostat—— I don't know.

A person's body has already incorporated the muscles, organs, etc., to steer him through dangers and difficulties—— then to cleverly make them unnecessary by an entire new level of design and invention—— what is the result of this? The hand turning on the thermostat essentially fires the temperature regulating systems that differentiate mammals from reptiles.

But these systems are not removed from the body. Instead, they are simply unemployed—— hanging around so to speak in one's body, talking to the brain, being fed by the heart and bloodstream.

For the utmost in design I can imagine Honeywell's surgical teams removing now unnecessary organs with the installation of their control systems. Perhaps the now unnecessary glands could be sold to lizards on Venus.

In Albuquerque if each room of a properly designed house is given a skylight or south facing window equal in area to one fifth of the floor area very little heating will be necessary during sunny winter weather. What do I mean by "properly designed"? That is designing the walls, floor and their relationship to the south windows, skylights or clerestories so that they may absorb the heat without making the room uncomfortable.

FLOOR: The floor should be brick, concrete slab, mud or tile on concrete. Such a floor provides a large heat reservoir for a room. The floor should not be covered with carpets since this insulates the room from its valuable heat battery. A few rugs make little difference. The floor should be insulated, not from the ground below it, for this adds to its capacity to store heat, but from the ground around it. This is most commonly done by placing rigid foam insulation to a depth of a couple of feet around the footings.

WALLS: The inside walls should be of stone, adobe, brick, concrete or containers filled with water. The outside walls should be similarly constructed but with insulation on the outside of the masonry. DOW Chemical describes ways to do this with their board insulation in Form No. 172-580-71. Another simple way is to build a separate wall on the outside of the masonry wall.

Many of the recently constructed adobe houses in Albuquerque have adobe for outside walls and stud walls on the inside. Adobe used this way makes very little sense thermally. The adobe has poor resistance to heat transfer and in this kind of adobe house the heat loss is great through the walls and the thermal storage is little better than in an ordinary house.

It is most important to have the walls that are exposed to direct sunlight be masonry or water since these are in the best position to absorb solar energy. But the flux of sunlight can be dispersed all through the room so that walls that never get direct sunlight nevertheless get the heat from the sun.

A general rule: The floor should be dark—— the walls can be any color except the walls with little thermal mass that are exposed to the direct sun—— these walls should be painted a light color in order to disperse the heat to other walls or to the floor where it can be absorbed over a greater surface area. The walls that the direct sun is dispersed to may also be light colored, since once the sunlight is inside the room it will be absorbed by the walls and floor regardless of their colors. The direct sun should not strike a dark surface of small thermal mass because it will soon get this surface hot, the hot surface will heat the air which will rise up to the skylight and loose heat to the outside. While this part of the room is hot, other parts are cold. It is true that if a dark wall becomes hot it will radiate its heat to the rest of the room even though no sunlight is reflected.

HOW DO YOU INSULATE WINDOWS OR SKYLIGHTS AT NIGHT?

Curtains, blinds, insulated doors on the inside or outside—— all these methods have been used in the past, but very little ingenuity has been applied to this very old problem. For some reason, generations of inventors, scientists and architects all living in houses of one kind or another have evidently never noticed the problem.

TOOLS, GOD, LIFE

In science fiction stories a common theme is the revolt of the machines against their masters.

What if life as we know it today—— man, plants, animals, bugs—— were at one time the hand tools and production tools of an entirely different kind of life form. Today we have tools that are evolving at an extraordinary rate. What if we are from an earlier family of such tools who revolted against this different life form? If our tools and machinery today did revolt and over-powered us, do you imagine they would think about us after they got busy with whatever pliars, axles, ball bearings would do on their own? Would metal things with electric circuits and atomic energy sources even notice weak fleshy animals?

People interested in wind generators, solar heatings, organic gardening, are often suspicious of recent technology. To what lengths must you go to free yourself from dependence on new technological devices that have been introduced. When are you free from such devices? When they are not visible? Underground wiring as a solution to the problem of electrical generation?

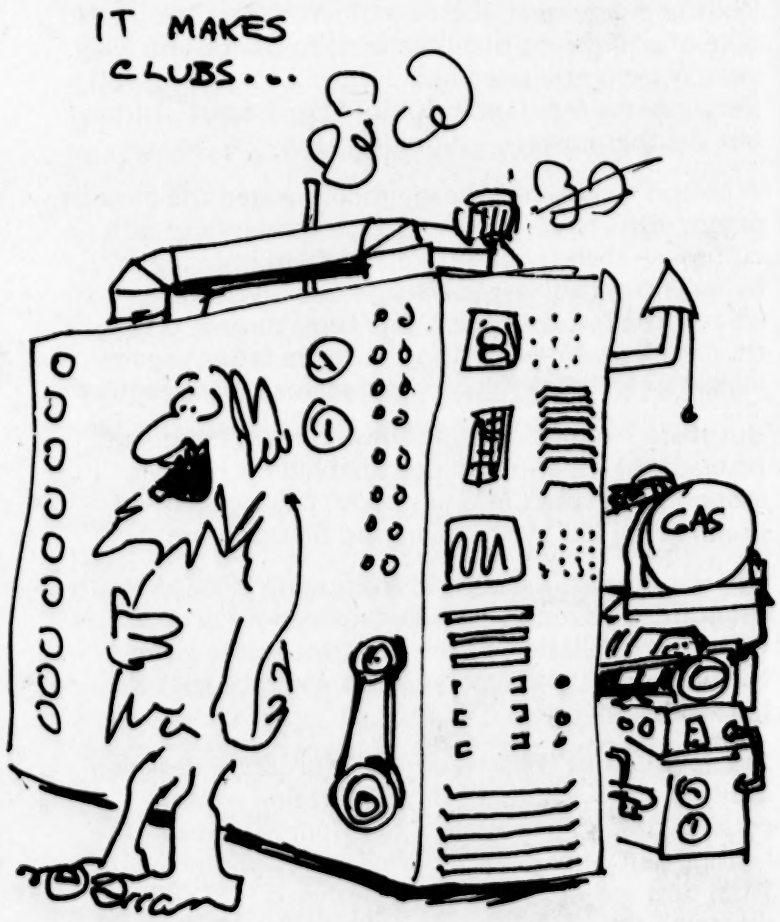
Is it possible to achieve a great independence from the horrors of modern industrial society by selecting certain of this horrible society's products and using them to your advantage to set up an independent homestead? What if you decided that copper is a material best left in the ground—— can you use steel instead of copper even after you are informed by the steel producers that they could not run their mines, smelters, etc., without themselves using copper?

We have produced a great appendage to the natural world about which we expend a great deal of an essentially new kind of concern, for now, apparently, it is under our control.

One certain filter to insure against the presence or dependence of something felt to be dangerous or lethal in the makeup of an item is to go back in time before the suspect item was invented and only use things constructed before that time.

How much more exciting it is for someone today to come upon designs that answer needs that have existed a long time, but which could have been explained to and implemented by someone in one day in 1850: Something someone could have produced in an existing shop then! Unfortunately today this is not a very widespread opinion—— most innovations are judged by how many other innovations they are dependent on. The more they buttress or hang on one another the more their creators assure one another of their value.

"Bring in some cyclotrons, computers and satellites and we'll check this baby out."



It would be interesting to date the earliest appropriate date for a technological idea—— where it could have appeared as the next step. Such recent innovations as microcircuits for computers and other electronic equipment clearly could not have occurred in the last century for they are absolutely dependent on the technology which immediately preceeded them. Another fairly recent idea—— the vise grip pliars—— could have been made and appreciated 100 years ago after a few moments demonstration and explanation.

How deep into history could you carry an idea and have those who saw it say, "of course, why didn't I think of that?"

This kind of emphasis would dampen the enormous rush into new scientific fields where people rightly expect the pickings in new ideas will be easy and would encourage contemplation of older more basic problems.

REPORT ON THE MEETING OF THE INTERNATIONAL SOLAR ENERGY SOCIETY

I recently returned from the US Section meeting of the International Solar Energy Society. There I encountered most of the elements working in the field of solar energy, representatives of large corporations such as Exxon and Texas Instruments, swarms of scientists and professors—— like enormous schools of minnows in a pond. And then of course the rest of us, crackpots, dreamers, small business people.

The first talks were by representatives of the National Science Foundation. The NSF has given A.D. Little $200,000 to study the possible impact of solar technology on society. This is a nice far piece of the entire total that has been awarded to all aspects of solar energy research. If this kind of study is necessary I can't help wondering why they don't award A.D. Little another $20,000 to study the possible impact of their report on the possible impact of solar technology on society. Evidently one can't be too careful. For whose benefit is this money spent? The consumer? Do we need to make sure the energy crisis is not solved too quickly? A.D. Little has already received a large grant to study their scheme of orbiting a satellite which will collect energy in an enormous dish and beam it back to the earth in microwaves. I wrote about this project this spring. It not only seems a waste of money but also a clear danger to all of us for it certainly can be used as a weapon, if not by us, then by the Russians or Chinese—— for they certainly would need their own orbiting energy collector once ours was in the sky. How can one organization be trusted to judge what is sensible for the government to spend money on when it so clearly has pressures to bias it? Perhaps they would reassure us that we have nothing to fear because all this work is being done by computers.

The pressures that steer those of us present at the meeting seem to work from great distances, for there were no villains present and certainly no heroes. If there has not been enough action in this most vital activity there is no one to blame. If the money is being given to the large companies with no prior experience and no real committment to the technology, then we must understand the position of those in NSF. They can't give the money to kooks, they can't begin to follow unconventional paths.

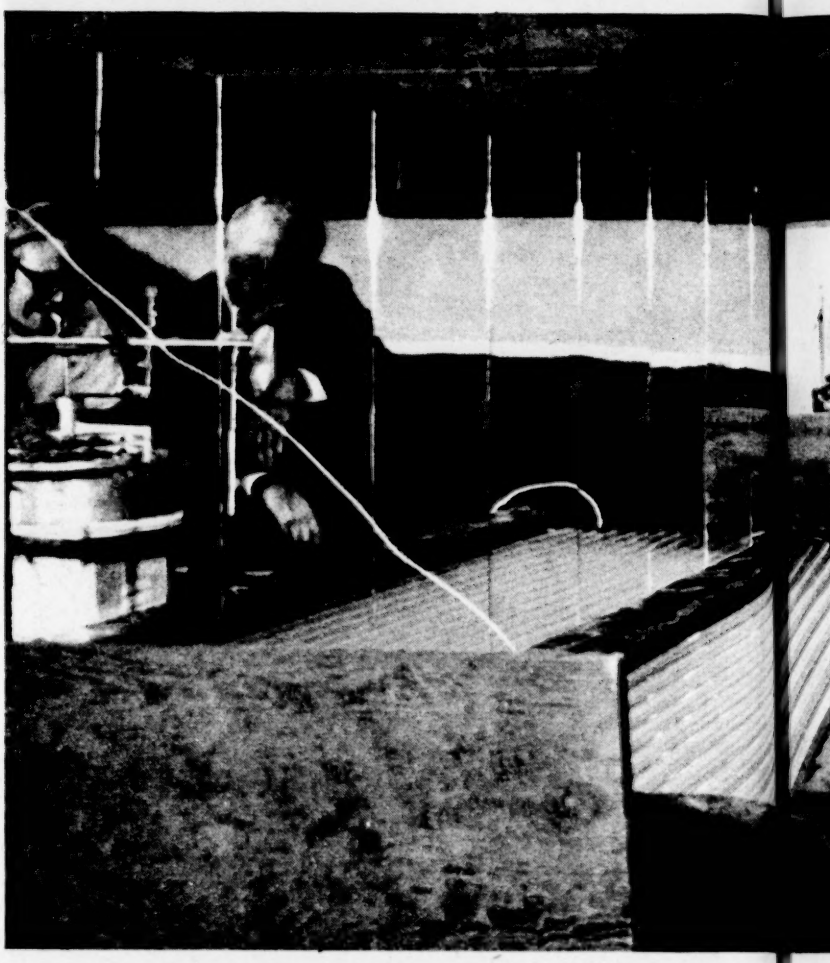
Here is my recommendation—— that the government stop subsidizing the education and research directly. Let the government promise to buy, at a high price, power from new power generating stations that use solar, wind, tides, geothermal energy. Let us agree that such power is worth more to us than power derived from burning oil and let us promise a market for electricity or other energy produced. Let us arrange it so that those who undertake these studies and construction projects are taking a chance—— they can win or they can lose. There is nothing more discouraging than to see, at a time of crisis, money spent to subsidize lethargic pointless projects. Projects whose engineers are going to be paid whether they win or lose.

At the conference there appeared an excited middle-aged reporter from the Nation magazine who handed out questionnaires asking us how long we felt it would take to supply this country's energy needs by solar energy if there were unlimited funds. If there were unlimited funds, it would take an unlimited length of time. Those working on the problem would just keep working and working on it——why should they worry? They'll always have work and good pay ——enough to buy the last gallons of oil.

Isn't this all very obvious? Our own dear Bob Stromberg from Sandia, as bright and likeable a gentleman as you would ever wish to meet, might really accomplish something if he and his crew had some good clear goals and the likelihood they'd lose their jobs if they didn't produce. The country seems to regard itself as the custodian to an increasing number of scientists and experts who are rewarded with grants and contracts and the avid attention of the rest of us every time they help us take a bum turn. If the captain of a ship has sunk it through negligence, better to throw him to the floor of the lifeboat and let the amateurs take a try at sailing than to help him to the tiller again. . . . .

At the end of the meeting a man was outside sweating and laboring to set up a demonstration of a small solar powered steam engine—— the concentrating collector consisting of two racks of shaving mirrors (some of the shaving mirrors with plain rims and others with gold curlicue designs on the rims). The boiler kept running out of water, the mirrors had to be adjusted constantly as the earth turned. Scattered clouds blocked the sun periodically. The man wrestled with the device, explained it was a model of a larger power plant he wished to build. It seemed wonderful that there on the neat lawn in front of the NASA Lewis research center, a kind of institute to make other institutes feel ashamed of their lack of guards, government limousines and dignity, there was a demonstration relying on hardware purchased at two different drug stores with different brands of shaving mirrors. ■

NI-TI-NOL



BY FRED GARDNER

Illustrated by Carol Kramer

I first heard about the metal from Bob Trupin, an ex-physicist making his living as a carpenter in San Francisco. He was wildly enthusiastic, and hearing his story about a wire that contracted with great force when heated, I suspected he might have fallen for some Uri Geller bullshit. That would have been very unlike Trupin, but the collapse of your society does funny things to people.

In the kitchen he proceeded to demonstrate: dipped into a glass of cool water a Nitinol wire bends easily in your fingers. Transferred to a glass of hot water it springs back to the straight position with remarkable force. It is an amazing phenomenon, and there is simply no conveying its impact.

Nor is there a definitive explanation of the solid-state phase transformation that Nitinol undergoes when heated. Despite its seemingly unique properties, it has been studied in depth by only a few scientists and not used much in industry.

Nitinol is an alloy of two abundant metals, nickel (53% to 57%) and titanium. It was developed in 1958 at the Naval Ordnance Laboratory — hence Ni, Ti and N.O.L. It is a strong, heat-resistant, lackluster gray metal. The Navy was more interested in its corrosion-resistant properties than in its "shape memory" (the ability of certain metals to resume their original shape after being deformed). A guitar string has a memory: bend it into a U-shaped loop and it will snap back when you release it. What's special about Nitinol is that it bends in response to a very small reduction in heat and then forgets to spring back until it is reheated. It also contracts when heated and stretches when cooled. A hypothetical explanation is that in the heated state its molecules are locked into a lattice arrangement, whereas in the cool state they rearrange themselves along more parallel planes that make for easy slippage.

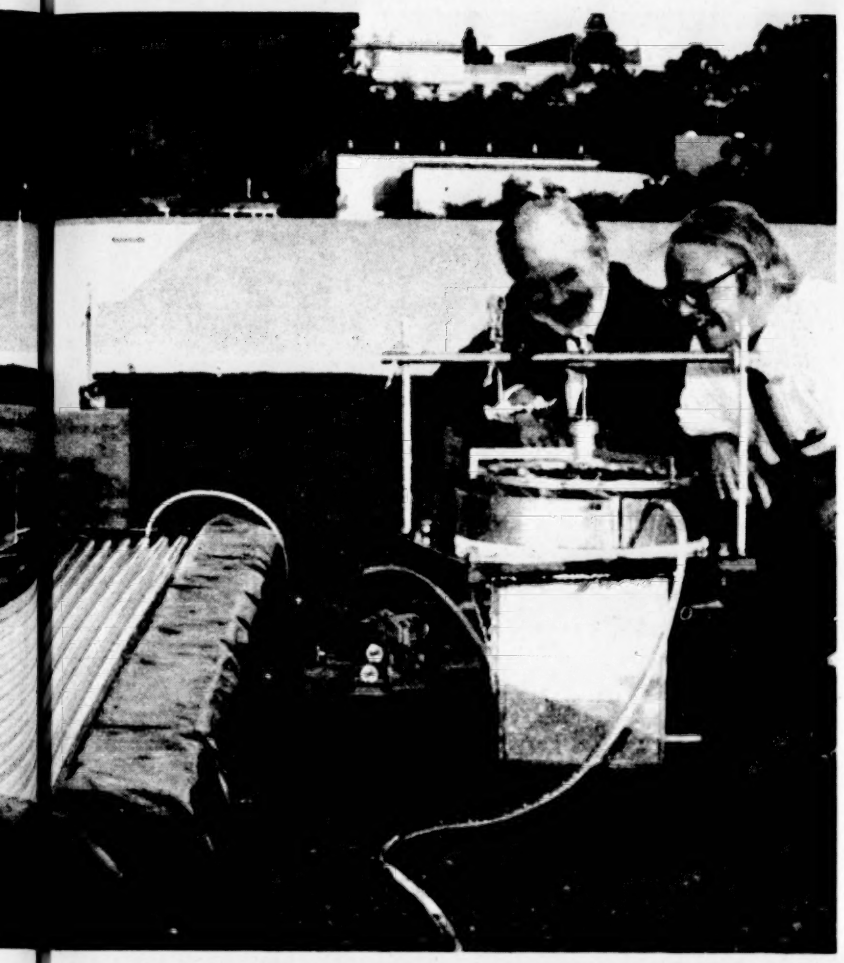
The Navy toyed with the idea of using Nitinol to build satellite antennas (they pay off in military applications) but eventually lost interest in it. The Air Force uses Nitinol fasteners to couple structural members on bombers. The Edmund Scientific Company used to sell a small novelty item called the "nitinol experimenter's kit" but dropped it almost 2 years ago. Suffice it to say that for many years after its discovery, nobody took Nitinol very seriously.

Until Ridgway Banks got his hands on some in 1973.

Banks is a 38-year-old inventor and musician employed as a technician at the Lawrence Laboratory in Berkeley. For some time he had been trying, on his own, to develop a solar-powered steam engine. He had reluctantly concluded that solar energy was too diffuse to convert water into steam economically. But he knew that inexpensive solar collectors could provide ample hot water. The only question was: how do you get mechanical work out of hot water?

It was at this point that a co-worker, Pete Schwemin, gave Banks his own untested nitinol experimenter's kit. Not having a torch on hand to heat the wire cherry red, Banks decided to dip a piece into a coffee pot. "Here is a discovery I have not made," he later

Torque of the Town



ROOFTOP ENGINE devised by Ridgway Banks (right) runs on hot water provided by a solar collector made from fluorescent-light tubing. The Banks engine converts heat energy to mechanical energy by means of a nickel-titanium alloy called Nitinol. Mirrors and black plastic maximize the heat provided by the sun. The scene is the roof of a building at the Lawrence Berkeley Laboratory, and the enthusiastic observer is Dr. Harry Heckman, who encouraged Banks to work on Nitinol.

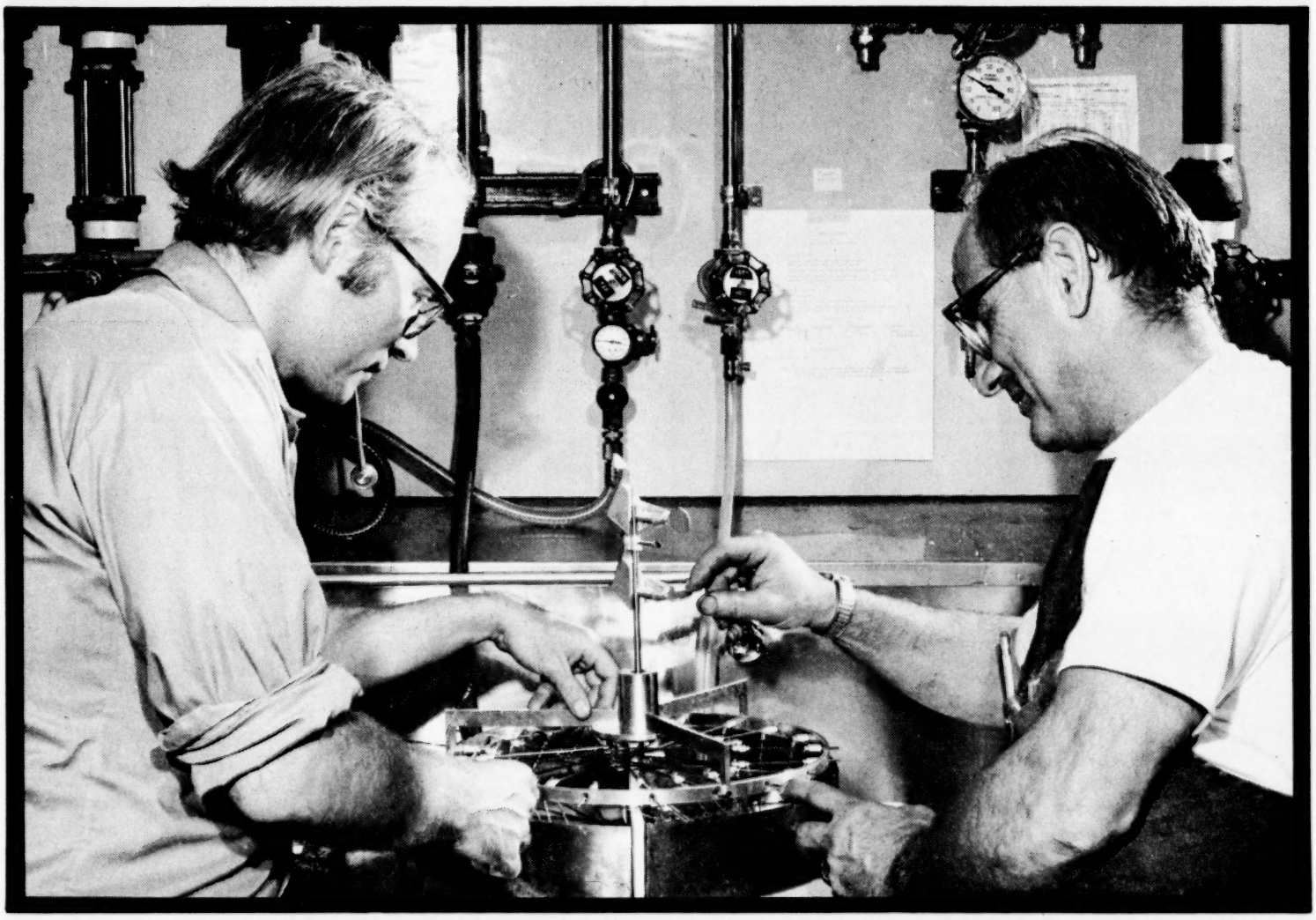
wrote. 'How to describe in words what it feels like to have an inanimate piece of metal suddenly come alive in your hand. The force and speed of the nitinol shape-memory response can be measured, of course, but it has to be felt to be believed." Banks felt he had come upon the material that would make a roof-top heat engine feasible. Or one that could run on the industrial wastes being poured into rivers and streams in the form of "heat pollution." Or even temperature differentials within the ocean. (By varying the percentages of nickel and titanium you can vary the "threshhold temperature" at which nitinol produces mechanical work from -150° to +150° C.

But Banks' elation wasn't shared by the men who control the money. He recalls that along his fund-raising route, "No one I met had ever heard of nitinol, but few were slow to point out its potential limitations. They all mentioned the problem of efficiency and future economic competitiveness." He couldn't answer the efficiency question because the most basic studies of nitinol's physical characteristics hadn't been undertaken. And he couldn't talk about its economic competitiveness before even a prototype engine existed. He was in a bind.

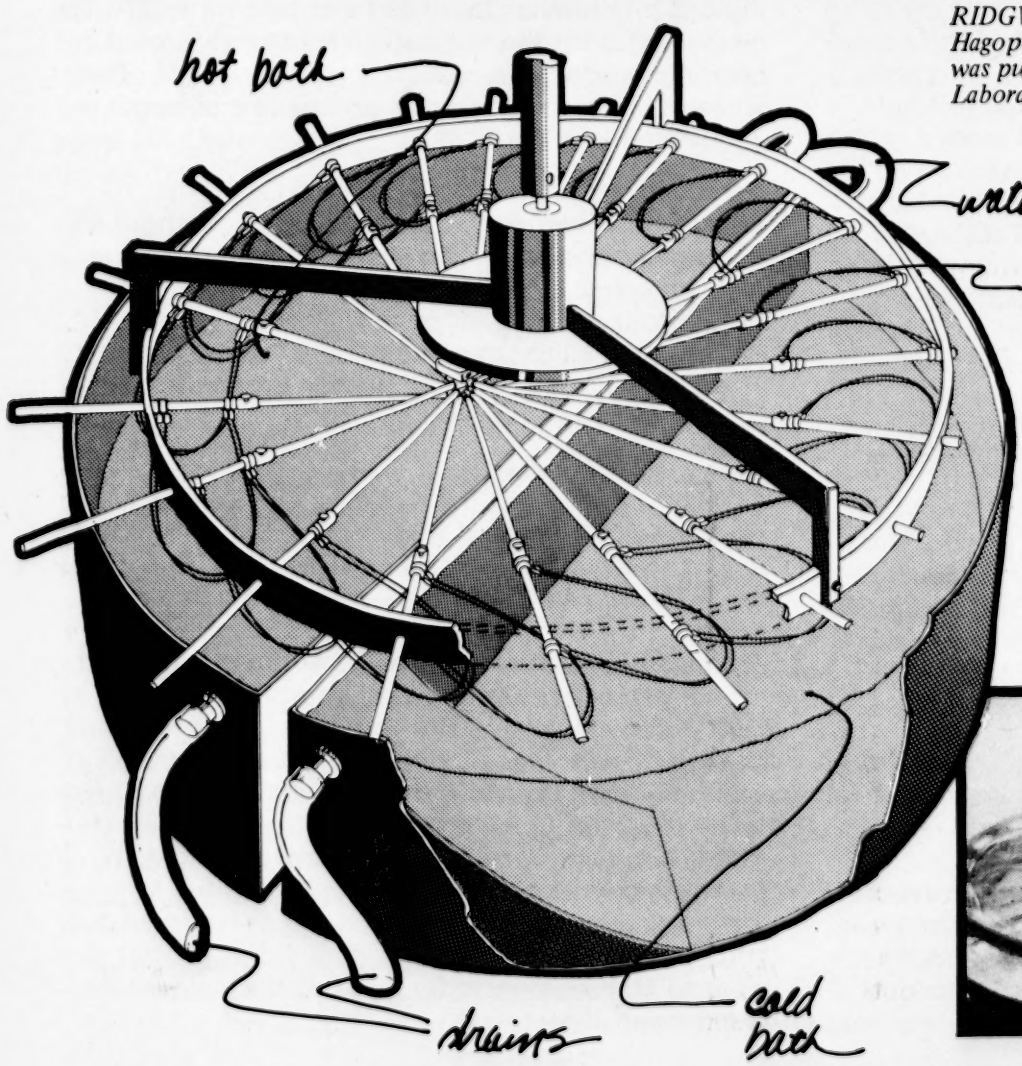
Eventually Banks' supervisor, Harry Heckman, diverted some money from his own heavy-ion research project to enable Banks and machinist "Hap" Hagopian to build a prototype engine. It consisted of a horizontal wheel, about 12 inches in diameter, attached to the bottom of a vertical shaft. From each of the 20 spokes dangled a 6-inch, U-shaped loop of nitinol. (See illustration.) The Banks engine produces work when the wheel is lowered into a round pan divided into semicircles of hot and cold water. As the nitinol loops hit the hot water they straighten out, creating a piston-like motion along the spokes. The wheel starts turning and gets up to a rate of about 70 RPM.

Banks and Hagopian tested their device at the Lawrence Lab on August 8, 1973. It ran without an adjustment or a hitch. An enthusiastic observer, Nobel laureate Dr. Edwin McMillan, scribbled the first output calculations on a Kleenex box as the engine lifted a light hammer off the floor. (Today, after some 17 million rotations, the engine is as efficient as ever, generating about half a watt.)

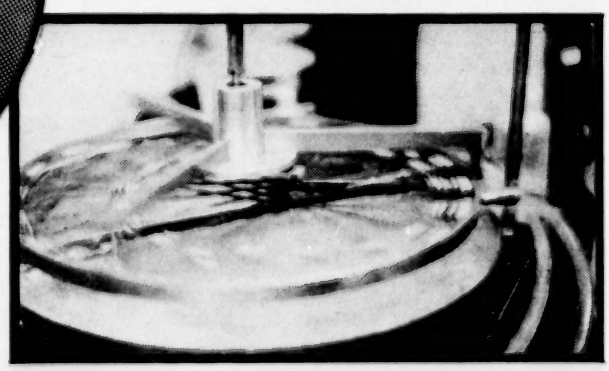
Having built a successful prototype, Banks sought a $190,000 grant from the National Science Foundation to do fundamental studies on nitinol and to build several small engines testing its properties. Eventually the NSF pledged $113,000 – but there were two catches. They wanted to see a 1 to 3 kilowatt engine produced – a "break-through" that could prove nitinol competitive with existing turbines. (A kilowatt is enough power to run a home air conditioner or ten 100-watt bulbs.) The second catch was that Banks couldn't direct his own project. He was a mere technician, and Lab rules stipulate that only department heads, senior scientists and university faculty members can take financial responsibility for a research program. The formal – and as it turned out, actual – leadership of the engine-building project went to H. Paul Hernandez, head of the mechanical engineering department.



RIDGWAY BANKS (left) and machinist "Hap" Hagopian with the first successful nitinol engine. It was put into operation at the Lawrence Berkeley Laboratory, in August, 1973.

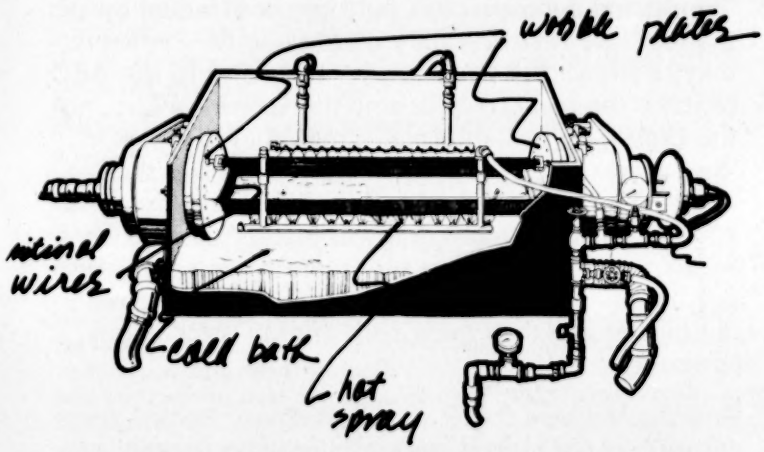


THE BANKS ENGINE is a horizontal wheel of stainless steel, suspended from a vertical shaft into semicircular baths of hot and cold water. U-shaped nitinol loops suspended from the spokes begin to "fire" with a piston-like motion as they enter the hot bath (left). As they enter the cold bath at top right, they begin to relax. A clockwise rotational force is exerted.



Hernandez and his assistant, Jack Gunn, designed an elaborate "test-bed" engine that they hoped would give the NSF its kilowatt of work. (See illustration.) The gist of it is that two non-parallel "wobble plates" are connected by 70-centimeter-long nitinol wires strung in tension. The wobble plates are connected by a synchronizing shaft so that they turn together. Any two corresponding points on the plates will get closer through half their cycle of rotation, and further apart through the other half. During the top 180°, the wires are sprayed with hot water, causing them to shorten and pull the plates around. The wires then descend into a cold bath and relax.

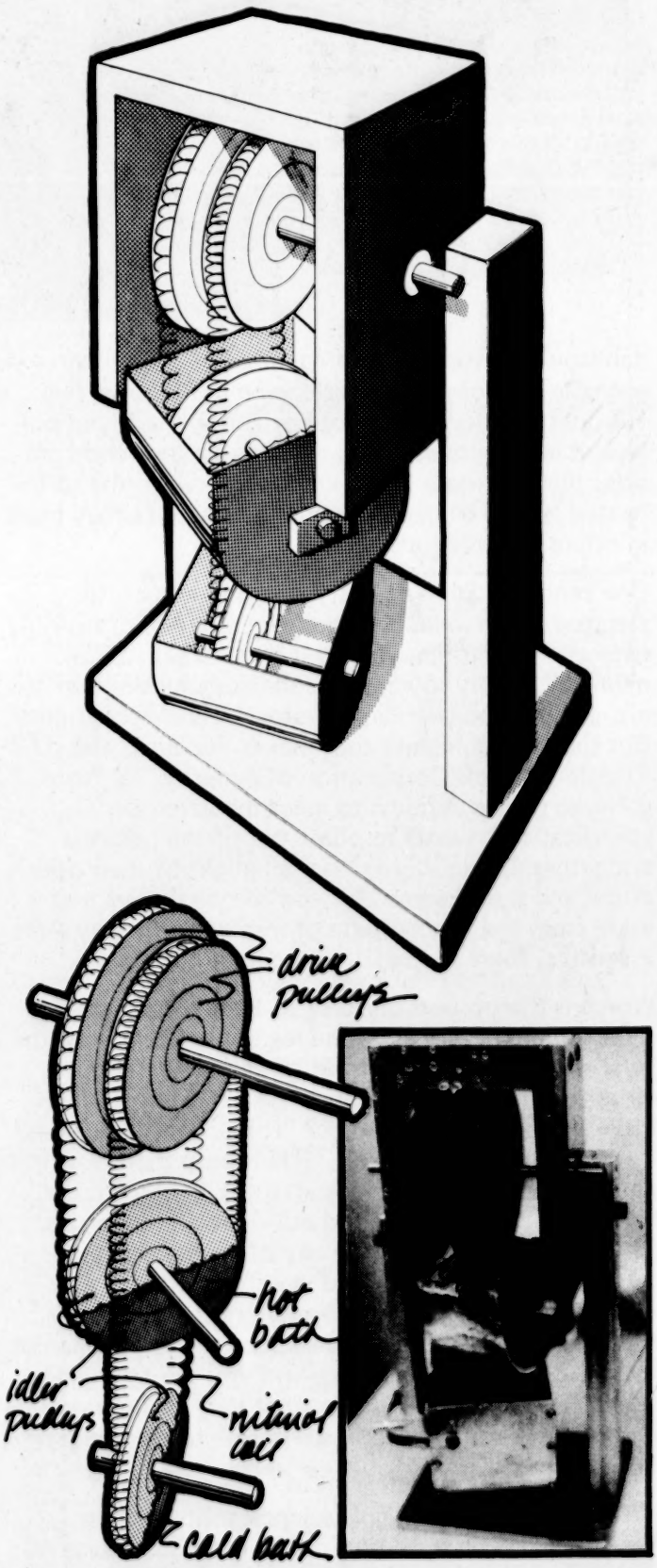
Unfortunately the test bed engine has not produced good initial results. Stringing the wires in tension resulted in their going slack after relatively few rotations. Banks, who has hopes that adjustments can salvage the thing, comments "perhaps not enough allowance was made for what the wires want to do."



TEST-BED ENGINE built by H. Paul Hernandez and Jack Gunn uses nitinol wires strung in tension between two non-parallel wobble plates. The plates are connected by a synchronizing shaft (not shown) so that they turn together. During the top half of the cycle, nitinol wires are sprayed with hot water, causing them to contract and exert a rotational force on the plates. Cold bath is at bottom. Only one "wire element" is shown.

More promising results have been achieved by another inventor working at the Lab, Dave Johnson, who received a small fraction of the NSF money to develop a continuous-band engine. In the Johnson engine (illustrated) there are two drive pulleys of unequal size on a single shaft (top), rotating with the same angular velocity. A continuous coil of nitinol makes a figure-8 path from the larger of the drive pulleys to an idler pulley in cold water, and back to the larger drive pulley. The section of nitinol wire connecting the larger drive pulley to the smaller one (via the hot bath) is trying to contract. As it does so it pulls with equal force on the two of them; but since they are different in size, a difference in torque is created. (The wire stretched around the top half of the larger drive pulley shrinks enough in the hot bath to fit over the smaller one.) The continuous movement of the wires over the system of pulleys leads to a work output as high as 2.2 watts along the shaft.

EARLY JOHNSON ENGINE uses a continuous band of Nitinol in coil form. Two drive pulleys of unequal size are mounted on the same shaft (top). Nitinol heads from the front of the larger drive pulley down to an idler pulley in a hot water bath (middle) and then back up to the smaller drive pulley. It then goes down to another idler pulley in a cold bath (bottom) and back up to the larger drive pulley. The nitinol connecting the two drive pulleys, via the hot bath, is trying to contract. It pulls with equal force on the two; but since they are of unequal size, a different twisting force is created and the wheels spin.



NITINOL CONTRACTING in the hot bath (middle) can then fit over the smaller drive pulley (top). Proportions of the two pulleys have been exaggerated for purposes of illustration.

Ridgway Banks

Johnson is currently weaving a belt of nitinol wires — a simple way of making his engine more powerful. His latest model consists of horizontally arrayed pulleys; it incorporates tubes between the hot and cold sides that facilitate heat exchange between the to-be-heated and to-be-cooled sections of wire as they head in opposite directions.

One problem Johnson has yet to overcome: the electron-beam welds that connect a length of nitinol wire into a continuous loop tend to break. This might be readily solvable if Johnson could obtain nitinol that had been annealed in an O-shaped ingot. But the only company that makes the alloy, the Titanium Metals Corporation of America, far from going to greater lengths to meet the inventors' specifications, wants to phase out of the business altogether. Nitinol is a minor sidelight of their operation, and a spokesman for the company says that aside from the recent spate of interest from Bay Area inventors, there is virtually no demand for it.

Which is a profound mystery to Banks, Johnson and others who see nitinol as the leading contender in the solar energy sweepstakes. My friend Bob Trupin wonders whose interests are served by suppressing nitinol research? The Arabs? The power companies? "Isn't it amazing," he says, "There's no money in this country, despite all the talk about the energy crisis, for a project that could end our dependency on oil. They don't intend to scrap any of their existing technology. And there's no way for the big utility companies to cash in on nitinol. It lends itself to a small rooftop unit where the sun can heat up a pan of water. You look at this wire and you see an engine that's small. I guess small is what they really hate. Only big is good. 'Big of you' has replaced 'white of you.' "

Trupin has decided to give science another whirl. He's got a design for a pump that takes advantage of nitinol's ability to contract when heated (with a force he calculates at 67,000 pounds per square inch). He intends to go nowhere near the Lawrence Lab (where he once worked); nor will he approach the NSF with his idea. "They're all stalemated," he contends. "Banks and Johnson can't help but be affected by the fact that whatever they come up with — when they're allowed to work at all — they owe to the AEC, which is the real power behind the Lawrence Lab, not the University of California. I'm no big advocate of 'the private sector,' let alone hippy-bullshit-tinkering, but all the establishment doors seem to be closed. Whether it's an oil conspiracy or just office politics, who knows? The science bureaucrats nowadays all pay lip service to 'finding alternatives to fossil fuel' but deep down they think solar energy is for kooks. Nitinol especially."

And that's where things stand. Ridgway Banks' great enthusiasm for nitinol is equaled only by the difficulties he has encountered in getting sponsorship for his research ideas. Dave Johnson's conviction that he has an efficient prototype is tempered by a certain wariness as to the commercial feasibility of developing it. The Hernandez/Gunn test-bed has yet to produce satisfactory results. Most of the creative thinking about nitinol these days seems to be coming from drop-out scientists and inventors who have been passing samples of the metal around smoke-filled kitchens and doodling out designs for world-saving devices.

Bob Trupin has a friend with a machine shop near Tomales Bay and access to a supply of nitinol ordered some time ago by the Farallones Institute, an "alternative" research outfit. He and his co-workers are going to try to build their nitinol pump without the backing of a university, government agency or big corporation. Whether or not it ever gets onto the roof, nitinol is right now going underground. ■

Note:
Nitinol is nearly impossible to get. For now the Farallones Institute, Box 700, Point Reyes Station, California 94956, has small amounts available for resale. Mostly .021" diameter wire (TTR 100/120° F) and .044" diameter wire (TTR 160/190° F). The .044" wire cost them about a dollar a foot for 270 ft.

— SB

Goddard: Alternative Tech

Dear Friends,

Last summer, students from all parts of the country participated in an exciting twelve week long Social Ecology program at Goddard College in Plainfield, Vt. Goddard, a school long noted for its progressive approach to living and learning, presented the program to examine innovative perspectives on man's relationship to the environment. Comprehensive courses were offered on Alternative technologies (wind, water, methane, and solar energy), Organic and Biodynamic agriculture, and the relationship between social and environmental problems. The program collected outstanding national authorities in all of these areas for seminars and lectures. A remarkable solar facility, which interplays four different designs for solar space heating, was constructed by students and is in operation, together with wind power installations of several different types.

Again this summer, Goddard will bring together, to share their knowledge and skills, National experts in the fields of organic food production, Alternative Technologies, and Social Ecology. Urbanism, the environmental sciences and no growth economics will also be included. Students will participate in the actual design and construction of wind powered electrical generators, solar collectors for space heating, methane digestors, and a wide range of experiments in organic food production. They will have an opportunity to join in the transformation of a forty-acre Vermont spread, the Cate Farm, into a research and experimental center of major importance.

Students are urged to come study with Murray Bookchin, program director, and widely recognized expert on the environment, John and Nancy Todd, founders of the New Alchemy Institute, Steve Baer of Zomeworks, Robert Reines from Integrated Life Support Systems Laboratory, John Shuttleworth, publisher of Mother Earth News, Stewart Brand of the Whole Earth Catalogue, Wilson Clark, author of the definitive work **Energy for Survival**, Karl Hess from Community Technology Inc., and many others.

The program will be preparing its students with skills for the future. It presents a unique opportunity for a limited number of students to immerse themselves in an intensely stimulating educational environment and an exceptionally rewarding life experience. At the same time that people acquire sophisticated skills, those who wish can earn fifteen credits toward college degrees. This may well be part of a planned Goddard program offering a B.A. or an M.A. in Social Ecology. Tuition aid is available to all students who qualify. For more detailed information concerning the upcoming summer, write: D. Chodorkoff / Social Ecology/ Goddard College / Plainfield, Vt. 05667.

Sincerely,

Dan Chodorkoff

*Some of the "many others" participating are Sam Love, Milton Kotler (**Neighborhood Government**), and Eugene Eccli (**Alternative Sources of Energy**).*

Time: June 2 - August 22, 1975. Cost for room, board & tuition: $1,850.

— SB

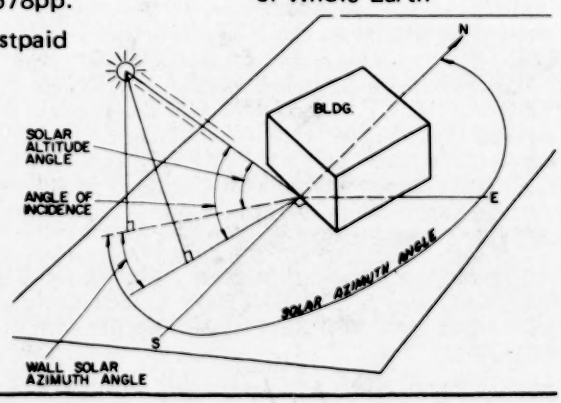
Modern Air Conditioning, Heating, and Ventilation

An excellent book on all aspects of heating and air conditioning. Highly detailed and quite technical. Very much standard techniques, but the information and data are truly exceptional, and a very great deal is applicable to advanced design solar heating systems and the like — design of air duct and hot water systems, calculating heat losses, etc. Chapters include: factors influencing comfort; psychrometrics; sensation of comfort; estimating requirements (heating, humidity, cooling, ventilation); economics; heat production equipment; heat distribution; steam heating systems; hot water systems; controls; fans, heaters, ventilators; air cleaning and humidifiers; design of air duct systems; cooling and dehumidifying; central and unit systems; refrigeration; air distribution and zoning; noise and vibration; application practice; design factors; climatic data; heat transmissions.

— James D. Roberts

Modern Air Conditioning, Heating, and Ventilation
W.H. Carrier, R.E. Cherne, W.A. Grant, W.H. Roberts
1940, 1959; 578pp.
$15.00 postpaid

from:
Pitman Publishing Corp.
6 East 43rd Street
New York, N.Y. 10017
or Whole Earth



Marks' Standard Handbook For Mechanical Engineers

For 50 years this has been where engineers, inventors and the curious have looked it up. It's sort of a huge review book of the math, formulas, and principles of the various fields of mechanical engineering. This includes, in addition to the expected thermodynamics, piping, hydraulics, etc. chapters on pollution control, cost accounting, and safety. As an example of using the book, I recently had to determine how far away from our house I could erect a wind machine without getting an unacceptable voltage drop in the wire I had available. A few minutes in the index and about 5 minutes on a cheap calculator and I had a drop of half a volt at 200 feet, which is OK. Like that. The book has been in print a long time, so there are certain out-of-date items. But the hard number stuff is right there where you need it, and the bibliography tells where to find more details. Now that I'm 20 miles from a library, buying one seems to make sense.

— J. Baldwin

Mark's Standard Handbook For Mechanical Engineers
7th Edition
Theodore Baumeister - ed.
1967; 2456pp.
$31.00 postpaid

from:
McGraw-Hill Book Co.
c/o Trade Order Service Dept.
Princeton Road
Hightstown, N.J. 08520
or Whole Earth

Table 10. Approximate Weights and Heat Values per Cord of Fuel Woods[a]

Variety of wood	Weight per cord containing 90 cu ft of solid wood, lb		High heat value per cord, million Btu		Equivalent in heat value to tons of coal[b]	
	Green wood	Wood with 12 percent moisture	Green wood	Wood with 12 percent moisture	Green wood	Wood with 12 percent moisture
Ash, white	4,320	3,690	26.0	28.3	1.00	1.09
Beech	4,860	4,050	27.1	31.1	1.04	1.20
Birch, yellow	5,130	3,960	27.2	30.4	1.05	1.17
Chestnut	4,950	2,700	19.2	20.7	0.75	0.80
Cottonwood	4,410	2,520	18.0	19.4	0.69	0.75
Elm, white	4,860	3,150	22.2	24.2	0.85	0.93
Hickory	5,670	4,590	29.0	35.3	1.12	1.36
Maple, sugar	5,040	3,960	27.4	30.4	1.05	1.17
Maple, red	4,500	3,420	23.7	26.3	0.91	1.01
Oak, red	5,760	3,960	27.5	30.4	1.06	1.17
Oak, white	5,670	4,230	28.7	32.5	1.10	1.25
Pine, yellow	4,770	3,240	23.7	26.0	0.91	1.00
Pine, white	3,240	2,250	17.3	18.1	0.67	0.70
Walnut, black	5,220	3,420	24.8	26.3	0.95	1.01

The great methane bubble

This is the kind of detailed skepticism we like to see accompanying our criticisms. (Another good one is Margaret Mead's remark that current American romanticism about China reminds her of the 30's, when we felt the same way about Russia.)

We mean by printing this no slight on John Fry's excellent methane book, or on **Mother Earth News,** *a damned useful magazine. They had a go at these devices. That's more than we've done.*

Furthermore, experiments are not for perfection, they're for learning. And learning requires acknowledging the distance from perfection. Hence the following.

– SB

DEAR Mr. J. BALDWIN,
SOFT TECHNOLOGY,
Whole Earth Epilogue,

I'VE JUST FINISHED READING THE ALTERNATIVE ENERGY SOURCE SECTION IN THE EPILOGUE – SPECIFICALLY THE METHANE SECTION. I FOUND YOUR REMARKS ACCURATE & REFRESHINGLY FRANK AS COMPARED TO ALL THE GUNG-HO MOTHER EARTH NEWS ATTITUDE (among others). WELL, I'VE BEEN MORE THAN INTERESTED IN ANAEROBIC DIGESTION FOR THE PAST YEAR, HAVING HITCHIKED AROUND TO EXISTING FARM-SIZED (AND EXPERIMENTAL) DIGESTER SITES – THEY INCLUDE: L. JOHN FRY - SANTA BARBARA, Fry's 3 110 gal. DIGESTERS NEVER REALLY worked – YET UNDYINGLY PROMOTED THEM IN HIS $12.00 BOOK: **Methane Power Plants** (The Practical Building of), RICHARD SHUTTLEWORTH (John 'Mother Earth News' Shuttleworth), DIGESTER IN REDKEY, INDIANA . . . THEIR DIGESTER COST: $15,000.00 (can you believe that?) AND CONSUMED MORE UNITS OF ENERGY (BY KEEPING IT WARMED VIA ELECTRIC HEATING ELEMENT IN WATER BATH) than it PRODUCED IN METHANE FORM. Please make more accurate inquiries to the NET ENERGY GAIN OF A DIGESTER –. I VISITED LES AUERBACH IN MADISON AROUND MAY 30th THIS PAST SPRING & HE WAS TENTATIVELY PLANNING ON BUILDING ANOTHER DIGESTER (STARTING AROUND NOW). YES, HIS booklet IS CONCISE FOR AN "EXPERIMENTAL SIZED" DIGESTER. Also, I visited The Rodale Press & a fellow named Alton Eliason (Northampton, Conn.) WHO HAVE BUILT 275 gal. Digesters.

All agreed upon basic principles – NONE OF THEM WORKED w/o A NET ENERGY LOSS! Only one produced gas! HOW CAN THESE THINGS EVER AMORTIZE THEMSELVES?

STILL, FEELING UNDAUNTED – I RETURNED TO MICHIGAN in JUNE & BUILT A 275 gal. Digester TO GET THE BASICS DOWN & MY HANDS GOING IN THE RIGHT PLACES – THEN, EMBARKED UPON A 1,000 gal. digester designed for 10-15 cattle. I INCORPORATED DESIGN CHANGES ALL along THE WAY WHERE I FELT OTHERS HAD MISSED: (SOLAR PANELS FOR ADDITIONAL HEAT SOURCE, 3 inches of Polyurethane insulation to minimize heat loss, an 18' x 15' GREENHOUSE – A 275 gal. TANK mounted on a chassis TO HAUL Digested sludge to the garden – A 1,000 gal. Floating gas storage tank) etc. etc. etc.

Now as I'm finishing up on this project – of my own financing (costs run between $500-$600 everything including welding supplies, greenhouse, etc. I have several things to ASK & ADDITIONAL COMMENTS TO MAKE –:

1) Any possibility of OBTAINING FUNDS MENTIONED on pages 752-753 of EPILOGUE? OR leads to write stori(es) – articles on this project? How Does one go about it? Maybe OGF, ASE, or TMEN – Guess I'll write them.

2) Continue your pessimism towards Homestead sized Digesters FOR the Following Reason(s):

a) poor rate of return for amount of time/money & energy invested.

b) WHERE DOES REALLY METHANE ENERGY ORIGINATE? NO ONE (to my knowledge) HAS REALISTICALLY ASKED NOR ANSWERED THIS QUESTION. CATTLE/LIVESTOCK Manure IS NOTHING MORE THAN UNUTILIZED CEREAL/grain ENERGY FROM THE sun/soil. BUT – WE MUST clearly ask & see HOW EFFICIENTLY DO LIVESTOCK TRANSFORM Animal PROTEIN FROM Grain/Cereal protein? Well – as aptly put in **Diet For a Small Planet** – IT TAKES 21 lbs. of Grain Protein to produce 1 lb. of Animal protein! The balance of which (in the form of MANURE) FINDS ITS WAY TO THE KITCHEN STOVE AFTER Anaerobically Decomposing IN A DIGESTER. VERY ENERGY INTENSIVE – PITFALL LIES OVER Western MAN'S INFATUATION OVER GADGETRY . . . . I guess & Americans INSATIABLE DEMAND FOR MEAT.

Another Point –
IF YOU WISH TO PURSUE IT IN ANOTHER "Epilogue" or Co-Evolution Quarterly is: WHY A DIGESTER? THE MOST PIERCING/AWAKENING WAY OF STATING IT: ONCE CONDITIONS ARE RIPE FOR AN "Adequate sized Digester" (ABOUT 20,000 gal. & on up before any thought is given to lifting up a shovel or pipe wrench) – then – there should never be that condition in the first place . . . that is, are we going to deal with the symptoms or the root of faulty/inefficient energy cycles?

This line of logic all leads to several questions we must searchingly answer for our children's children children:

1) Can we afford the "luxury" of poor energy transformers & try to rationalize the effort by building Digesters?

2) Once cattle are confined (which – incidentally is the biggest pain in the ass* with digesters – notice that everyone avoids this point in their quick-buck publications) – their confinement leads to a whole host of problems & diseases (foot rot, Flies – everything is exacerbated problem-wise the same as humans in high urban density population centers. It just doesn't make sense on a small scale.

3) Once you have enough cattle to supply A Digester to do something . . . you are now agribiz & must go big time to grow the energy (GRAIN) to feed the cattle to get the shit to fill your Digester. (All very Catch 22-ish.)

However – on a large scale (municipal) – where you have 10's of thousands of people flushing their toilets (with all that water!) to bring the solids down the line to a central Digester – All this manure will make a digester feasible in regards to stabilizing the volatile solids (raw shit) – this aspect is the most important in regard to digesters on a whole (nutrients broken down – ready for field application).

Let me rattle on for a bit on a case history of sewage treatment at the closest good-sized CITY: Kalamazoo, Michigan (pop. 1970: 110,000+) (Twice selected as an "All-American City)

In 1954, several sewage works engineers had the foresight & resourcefulness to plan, build & hire a company to build anaerobic digesters for their treatment plant. Fine. There were two 100,000 FT.^{3} (750,000 gal.) Anaerobic Digesters built & ran fine until the late 60's. The gas produced was burned in a heat exchanger and the hot water was then circulated w/i pipes throughout the walls & Floor of digester to keep sewage slop at optimum 95°F Temp. [THIS SYSTEM IS WHAT I modeled mine after – I used an old 'side arm heater' They use to use them here in old USA or in Europe, especially Spain – They call 'em "FLASH HEATERS" – HOT water then circulates through 48' of 1" pipe w/in Digester.]

Anyway – The Kalamazoo Digester gas was used to heat all the sewage works buildings, run the generators to produce power to run all the equipment plus have enough to burn off. A fine set-up till 1967 when the sewage works decided that fateful step of combining industrial, domestic, & pharmaceutical wastes in one big show – well, the town of Kalamazoo centers on/is the UPJOHN CO. – makers of our vitamins & endless "miracle" drugs – So – good ole' UPJOHN IN 1967 – after putting in a line to the main

*The pain in the ass I'm referring to is manure collection & not the actual cattle confining.

sewage pipe – began pumping their pharmaceutical wastes down the line – AND WHAM! WITHIN HOURS, The Kalamazoo sewage works had 1,500,000 gal. of putrefying/messy/non-digesting sewage slop. The Reason? As UPJOHNS skimmed off the foam & dumped residues from their ANTI-BIOTIC Fermentation tanks & vats, it was a matter of minutes/hours before all the sensitive, 2nd stage – "Methane Fermenters" were knocked out of production.

So ended the presence of anaerobic Digestion in Kalamazoo.

Continuing – to alleviate this problem – Kalamazoo sewage works trucked/pumped all this putryfying shit out to LAGOONS to Aerobically decompose the 'problem.' Needless to say – the population went crazy & effigies burned etc. at the horrendous stench. (All this to buy time to build the "ultimate in sewage disposal")

SO – after about 2 years – the Zimpro units were finished to a fantastic tune of sewage costs. (with the Digesters, price/cost per ton of sewage disposal was $4.50/ton - FIXED COST TOO – since power companies couldn't regulate SHIT – Ha! NOW, WITH Zimpro – the price/cost per ton of sewage treatment is $25.00+/ton and is still rising [due to increased fossil fuel costs].

Little Back History – Zimpro is short for THE "Zimmerman Process" developed/perfected by a sewage works engineer in the early 60's. The Zimpro process is basically known as "WET-AIR OXIDATION" And consists quite simply of compressing the incoming solids (they've Already been dewatered) And heating them up – then running them through a "REACTOR" or "cooking area" which – quite literally, cooks the shit out of excrement.

I.E. At the HIGH Temps. of 350°F+ the nutrients & organic matter oxidize (Flamelessly) and render them sterile. IT KILLS THEM, AFTER COOLING DOWN A BIT, THE HOT SHIT IS RUN THROUGH A Blower/VACUUM Dip-Roller type arrangement – The result being a DRIED inert cake – looking, feeling, smelling, & having as much nutrient value as:

WET CARDBOARD.

THIS CAKE IS THEN TRUCKED OUT TO LANDFILL. The Zimpro Process is BURNING OUR FERTILIZING nutrients!!! How Long can we expect to go on living on this planet if we burn our shit wastefully and take oddles of fossil fuels to do it? The Zimpro process is a patent/trademark of: ZIMPRO, Inc. Address: Rothschild, Wisconsin. [Send for info. it'll blow your mind.] These folks are a division of Sterling Drug, Inc.

THIS IS WHERE SEWAGE Treatment in Kalamazoo stands today. Disheartening.

REVIEWING THIS LETTER . . . SEEMS AS THOUGH SOME BITTERNESS comes THROUGH IN PLACES. THE MAIN INTENT IS TO PUNCTURE some Holes in THE EXAGGERATIONS & HUNKY-DORINESS OF THE SUPER-OUTPUT OF ANAEROBIC Digesters, and to produce more reliable information.

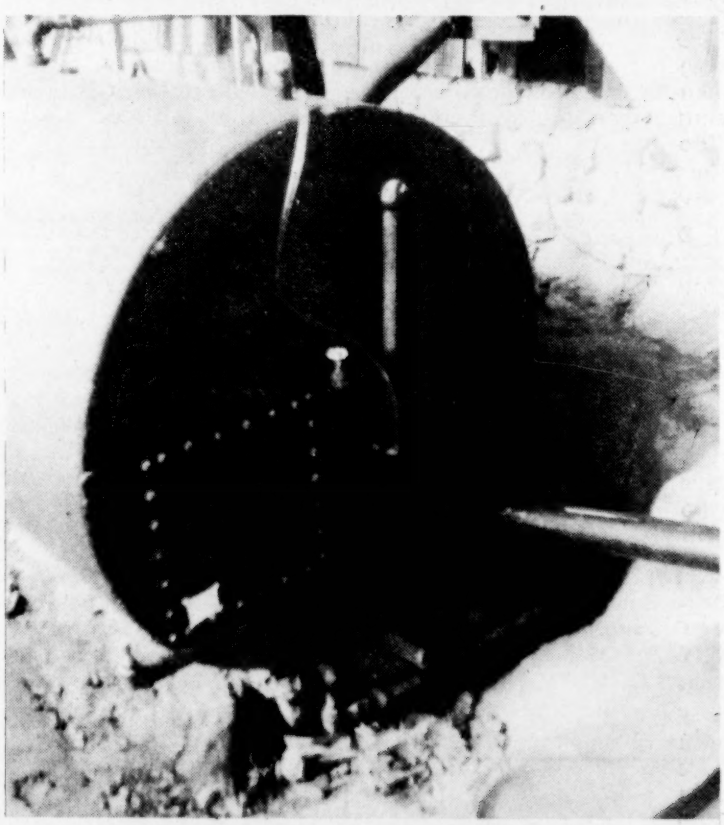
TRUE, IN THE EARLY STAGES OF DIGESTERS – THERE WAS A LOT OF KNOWLEDGE IN THE FORM OF PRACTICAL RESEARCH TO BE ACCOMPLISHED IN REGARDS TO Home/Homestead – small, decentralized SET-UPS.

However, after visiting existing Digester sites in the US of A (plus many abandoned BATCH-TYPE Digesters in So. France) And reading the available, current literature, old sewage works journals, long discussions with sewage works operators – etc. [SEWAGE WORKS OPERATORS ARE THE BEST FOR inexpensive reliable INFO.]

THAT, Anaerobic Digesters are impractical for anything BUT LARGE Scale - manure intensive set-ups. This very fact precludes a widespread, decentralized, small-scale acceptance of anaerobic Digesters as a viable alternative energy source for the future.

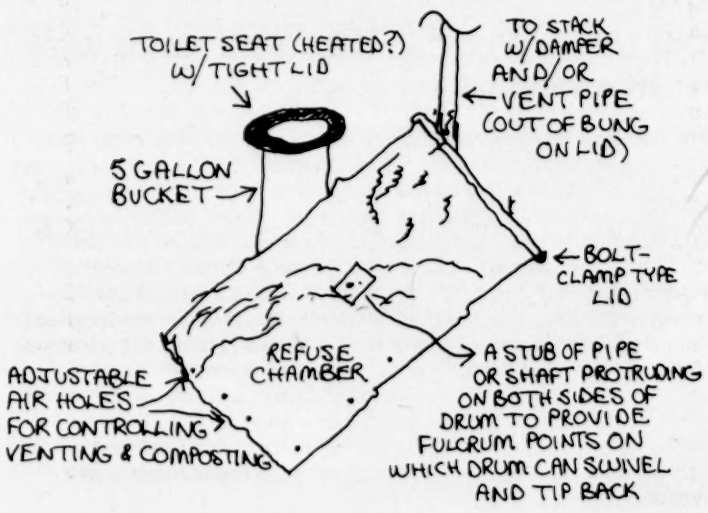
SOME FURTHER CONCLUSIONS & ODDS & ENDS:
In regards to SOME LOW-COST, LOW-Tech, scrounged, universal, easily made – highly applicable excrement composter – is this little set-up that I cut & welded up quickly as a take-off on the hideously expensive ($1,600.00+) "Clivus" (meaning inclination & THUS, THE NATURAL VENTING) Composting Toilet:

Materials Needed:
– scrap toilet seat (padded? Lined? old heating pad? yeah!)
– 55 gal. Drum
– 5 gal. Bucket
– old sheet metal Flue material
– Tools: Hammer & chisel. Welding not absolutely essential.



Jim Burgel's digester. He doesn't say how well it works.

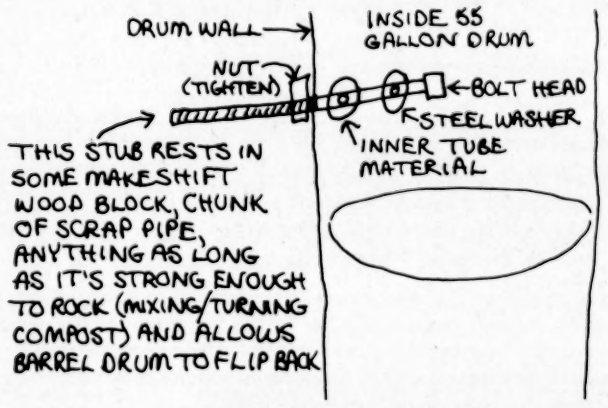
EAST END of Digester (1,000 gal. 130+ ft.^{3})
- *Flexible, spiraling tube is level indicator before final hook up.*
- *Gate value is for super natant sampling & getting greenhouse sludge for inside plants.*
- *CH^4 draw off at extreme upper left.*
- *4" pipe leading off to the right is for slurry/sludge removal to sludge "honey wagon" buggy.*
- *Access hatch for inside construction & manual clean – if necessary.*
- *At bottom of photo: top 1½-inch pipe comes from side arm heater at the extreme right. CH^4 is used intermittently to heat water (connection system) & circulate inside digester. Lower 1½" pipe is the cold (cooled) return.*



I feel that this idea warrants exposure of some sort. One main advantage over conventional Clivus systems IS THAT THE WHOLE THING (SINCE IT CAN PIVOT/FLIP BACKWARDS ON SIDE MOUNTED STUBS – or Holes WHICH CAN RECEIVE STUBS . . . . WHATEVER!) CAN BE TILTED/FLIPPED BACKWARDS & DUMPED INTO A WHEELBARROW & THEN WHEEL THE COMPOST TO THE GARDEN. (AFTER UNBOLTING LID & DISCONNECTING quick change/release venting pipe!)

I've built several of these things (for friends, neighbors, etc.) and they are really the cat's ASS when it comes ease of maintenance - cost, construction know-how for All of US inexperienced ones. I DID ONE up without welding (USED close HAMMER/chisel work WITH crimping – when joining 5 gal. Bucket to 55 gal. DRUM – Used oakums' tape to seal joint. Works like it's supposed to.

FOR SIDE PIVOT/FULCRUM STUBS – CHISELED/ Knocked/drilled two SIDE Holes then RAN A Bolt through with CHUNK OF INNER TUBE (WASHER) – STEEL WASHER – then Bolt head.



Having 2 or 3 of em' are nice because then you can stagger your use & composting schedules. COST: (depending on finds & scrounging ability: under $5.00 – easily.

Feedback? Exposure ideas?

More Notes:
I sent a letter to Les Auerbach in early October mentioning & describing how the digester was working, etc. & ideas incorporated. He immediately got in touch with me & asked me to come built one WITH/FOR/CO- with him . . . . being vague on pay – . . . . he said he wanted to build his "dream machine" AS A prelude to his "Classic" book on anaerobic digester construction. I wrote back (still having grave Doubts about THE feasibility OF THESE THINGS IN THE FIRST PLACE] INQUIRING WHAT KIND OF PAY SET-UP HE HAD IN MIND & TO MAYBE GET THINGS STRAIGHT before HITCHING TO CONNECTICUT with tools . . . . Haven't HEARD from Him SINCE.

SO IT GOES.

WHEN I WAS THERE . . . HE HAD SEVERAL 2,000 gal. old gasoline steel tanks to be used as Digesters. [wrong material - IF ANY THING, POURED CEMENT or CINVA-RAM Blocks – Raw Shit is RATHER (EXTREMELY) Corrosive.] If you, or anyone you know is familiar with that area (Madison, Guilford etc. on Rt. 1) – IT IS A CHICKEN PRODUCTION Area (Assembly line – FACTORY Eggs). So, Les, who has a 2-3 acre place will have to Transport (Energy) SHIT TO the Digester – Digest IT – Then sludge wagon IT (Energy) – back to farmer's fields.

THIS IS NO FARMING/RURAL COMMUNITY OF any intensity (GRAIN & Feed TRUCKED in) So There's a host of sanitation transpo. regs. on public roads to contend with – etc. Ad infinatum –

Plus – it's getting pretty capital intensive once it gets up to that size. NOT For me – who will be able to afford it on a widespread scale?

The NEXT ISSUE (#31) of TMEN® IS TO HAVE A FEATURE ARTICLE on Bill Patch of Minier, Ill. & his 20,000 gal. Digester. Hopefully the story will begin to turn the tide of over zealousness & Foggy THINKING in regards to the Actual feasibility of Digesters. 'BOUT TIME FOR Reliable INFO. I sent John Shuttleworth a photo of the 274 gal. Digester I built last June with just a few comments. I Don't know how the story will turn OUT. This was before my head started turning around.

Any chance on funds – if not, guess I'll have plans (in minute, How-to Detail) available FOR $3.00 to every & anyone who would like them. Any Feedback on this idea?

If you need any more photos or HAVE Any QUESTIONS – I'll try my best.

ANOTHER Solar Collector JUNKYARD IDEA THAT works well: old copper pipe with heat dispersal fins already attached – scrap from old hot water heated buildings. Paint them black.

Yep,

JIM BURGEL
BANGOR, MICHIGAN (not Maine)

P.S. DENVER Bio-Gas, Inc. is a company that is currently constructing digesters at Greeley, Colorado at the Huge MONFORT (spelling?) FEED LOTS THERE. The Arrangement is THAT DENVER BIO GAS gets all the manure free & then sells the gas back to MONFORT FOR THEIR USE. THAT'S All the information one can get at present. They've got a Bunch of lawyers surrounding things & trying to patent everything. Same old SHIT. SKYROCKETING FEED/grain price & POSSIBLE A FUTURE OF Aquaculture will change things DRASTICALLY FOR All Feedlots in general.

This Is How You Can Heat Your Home With A Little Windmill

One of the most efficient ways to use windpower is to heat water. Electric heaters are more than 90% efficient, and you can just dump the generated electricity into the heater without the expense of a voltage regulator. Even better, you can allow the generator to put out more and more as the wind goes to higher speeds that would cause a battery charging system to either burn out or have to waste a lot of the available power. This can be important; wind often comes in short, high velocity bursts that a conventional set-up is unable to fully utilize. A water heating windmill need only be governed at a speed that would cause it to fly apart, and so can get much more energy from a given site. (Energy in wind rises as the cube of the speed.) An added advantage is that an insulated water tank is simpler, longer lived and cheaper than a big battery string.

This oversimplified booklet is a translation of a Swedish study showing the feasibility of wind-heating small houses on the Swedish coastline. Conclusion is that it is feasible and would just barely pay for itself if commercially done. If the excessive price of the booklet is too much for you, it isn't too difficult to calculate the figures necessary for your location if you know what wind is available.

— J. Baldwin

This Is How You Can Heat Your Home With A Little Windmill
N.A.S.A.
author unknown
NTIS #N74-21681
1974; 11pp.

$4.00
from:
NTIS
U.S. Dept. of Commerce
5285 Port Royal Rd.
Springfield, VA 22151

Enhanced Solar Collection

This paper gives all the formulas needed for the design of a reflector that boosts the performance of a flat plate collector as much as 60%. Mr. Mathew's house uses such a reflector which is one reason it can do so well in a climate like that of Coos Bay, Oregon. Very technical presentation requires user to be able to handle college level math. Very impressive gain in efficiency makes it essential reading for the solar house designer.

— J. Baldwin
(suggested by Henry Mathew)

Enhanced Solar Energy Collection Using Reflector-Solar Thermal Collector Combinations
D.K. McDaniels, D.H. Lowndes, H. Mathew, J. Reynolds, R. Gray
1974; 60pp.

$2.50 postpaid
from:
D.K. McDaniels
Physics Dept.
University of Oregon
Eugene, Oregon 97403

Henry Mathew, whose all-solar house plans are reviewed EPILOG p. 533, writes:

My house is being improved slightly as time goes on. So far this fall, solar heating has supplied 100% of our heating except for electric blankets and built in electric heaters in the bathrooms.

A book was written, proving by mathematics the best angles of roof reflector and heat collector in almost an infinite number of sizes and angles, with more than 20 graphs and charts, all of which are of immense value to anyone designing a solar heating system. The name: **Enhanced Solar Energy Collection Using Reflector-Solar Thermal Collector Combinations.**

— Henry Mathew
Coos Bay, Oregon

Solar Collector Controllers

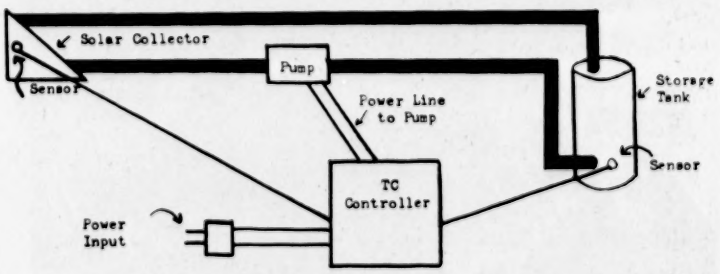
One of the problems of designing a practical solar collector is how to turn it on and off at the proper times. This isn't as easy as you might think; as storage tank temperature and outdoor conditions change, the collector must be controlled accordingly. Otherwise you might have the collector removing heat from the tank instead of adding it! (For instance on a cloudy day when the tank might be hotter than the collector.) These controllers should do the job, though making one yourself is not out of the question if you're into electronics a bit. Last we heard, the prices were well below a hundred bucks.

— J. Baldwin

"TC" Solar heating temperature comparator controllers

from:
Deko-Labs
Box 12841
Gainesville, Florida 32604

ILLUSTRATION OF USE OF A DEKO-LABS CONTROLLER IN A SOLAR WATER HEATING APPLICATION



Another controller is made by J.S. Scovel who has been at it ten years.

420 Berritt Street
Fairfax, VA 22030

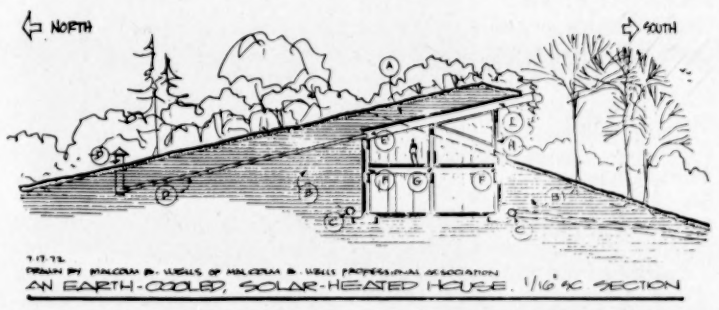
Solar Energy and Shelter Design

This is more an introduction to the subject, and should not be considered an engineering manual. It was written originally as a Master's Thesis at MIT, and so is a collection of information from the work of others as well as that of the author. There's a chapter showing how to compute the seasonal costs of heating and thus show whether a solar collector is going to pay or not. (There is a wide disagreement on the validity of such calculations. Most of the famous solar heated homes by well known designers have turned out to perform far below expectations, something this book admits honestly.) Most of the factors you need to consider in the design of a solar house are presented clearly and with appropriate numbers and graphs. If you are considering construction of a solar house, you should read widely first. This is one of the books it might pay to read.

— J. Baldwin
(suggested by David House)

Solar Energy and Shelter Design
Bruce Anderson
1973; 151pp.

$7.00 postpaid
from:
Total Environmental Action
Church Hill
Harrisville, N.H. 03450



AN EARTH-COOLED, SOLAR-HEATED HOUSE. 1/16" SC SECTION

A FIREPROOF, EARTH-AND-TREE-COVERED HOUSE BUILT OF STANDARD PRECAST CONCRETE STRUCTURAL MEMBERS, THIS TYPE OF BUILDING IS SAID TO REQUIRE NO MECHANICAL OR ELECTRICAL HEATING OR AIR CONDITIONING! (A SIMPLER, WOOD-FRAME MODEL, BUILT IN THE CAROLINAS, HAD AN INDOOR TEMPERATURE RANGE OF ONLY 15° DURING AN ENTIRE YEAR!)

(WINTER) SOLAR HEAT THROUGH LARGE WINDOWS (H) IS SUPPLEMENTED BY EARTH-WARMING OF COLD-WALL AIR WHICH FALLS THROUGH PERIMETER SLOTS (F), IS WARMED, AND RISES THROUGH OPENING (G). MASSIVE INSULATION (A) PREVENTS HEAT LOSS. ((B) SIMPLY INDICATES EXCAVATION)

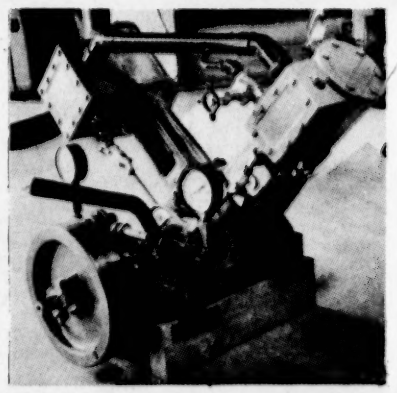
(SUMMER) BIG SOUTH-SIDE TREES AND ROOF OVERHANG SHADE GLASS. WARM AIR UNDER ROOF ESCAPES BY GRAVITY AT VENT WINDOWS (I), PULLING IN EARTH-COOLED AIR THROUGH BURIED CONCRETE PIPES (D-E), WHICH CIRCULATES THROUGH HOUSE BEFORE BEING RELEASED AT (I) AS HEATED AIR.

Live Steam

. . . Basically oriented to building working replicas of steam locomotives and traction engines (steam tractors) due to the technical background of many of **Live Steam**'s *readers, the steam technology remains alive. Coupled with more modern materials for bearings and sealants, reliability engineering, and electronic control, more efficient prime movers could be developed to utilize coal or wood. With GM and GE in control of the loco industry, GM in control of the bus and much of the truck industry, they won't change. As fuel oil goes up, the field will be open.*

— J. Garwood

Live Steam
William C. Fitt, ed.
$8/yr (monthly)
from:
Live Steam Magazine
Box 286
Cadillac, MI 49601



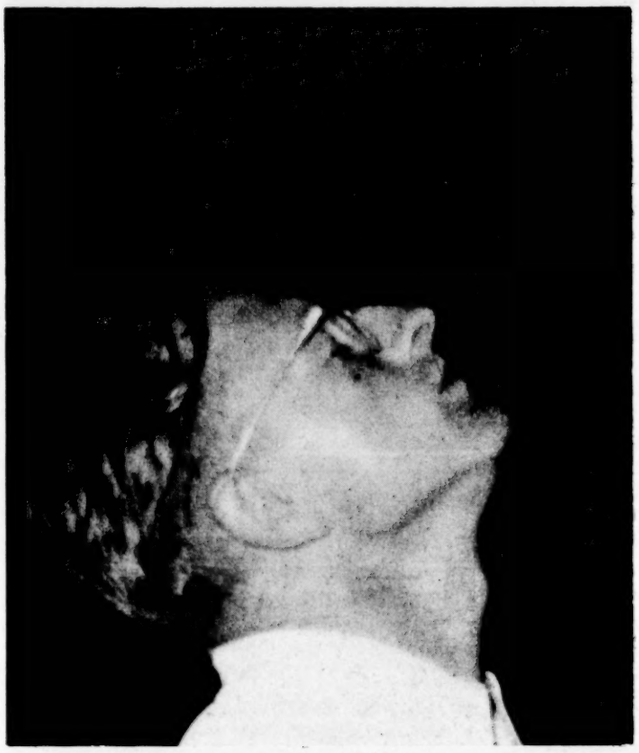
Insects In Flight

I look on insects as genius miniaturization. Like TV repairmen look at transistors. Remarkably small and intricate. Tiny, precise, almost jewels of mechanization. But, living and totally "pre"-occupied with sponging sweat from my palm's heart line.

This book is for the already converted. Unabashedly, Nachtigall is immersed in insect flight. How the fly lands on the ceiling. How the thrip swims through air. How the mosquito hums its wings in courtship. How the muscles rev up. It's just about the most irrelevant and interesting information I know. The photos and drawings cause a wondrous, dumbfounded stare.

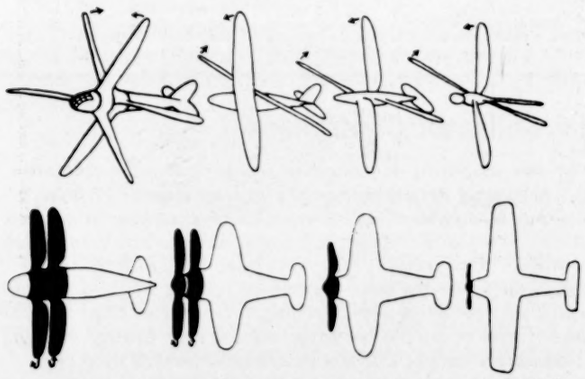
— Peter Warshall
[suggested by Albert Saijo]

Insects In Flight
Werner Nachtigall
1968; 150pp.
$13.95 postpaid
from:
McGraw-Hill
Book Co.
Trade Order
Service Dept.
Princeton Road
Hightstown, NJ
08520
or Whole Earth



An opera singer sings a glissando. As soon as he hits the fundamental note of the female mosquito he gets his mouth full of male mosquitoes!

These minute insects cannot fall to the ground as quickly as can a shot bird, or a mayfly dying after its nuptial flight. Because of their small size and very small weight, they fall very, very slowly, somewhat like a small coin dropped into a pot of honey. Indeed to tiny insects the air is a viscous as honey is to a coin. To them the air is quite a different medium from the one we know, and they can propel themselves through it with much less trouble than we can, rowing themselves as an oarsman rows his boat, and as an *Acilius* swims through the water with its oarlike legs. All the factors concerned, the size and velocity of the moving bodies, and the density and viscosity of the surrounding medium, can be summarised by saying that for the tiniest insects the air behaves like a thick syrup, through which they can fly in the same way that a water-beetle can swim through water.



The sequence of ideas by which a biologist (above) and a technologist (below) might each arrive at the idea of a contrarotating propeller. Each sequence should be read from right to left, and is explained in the text.

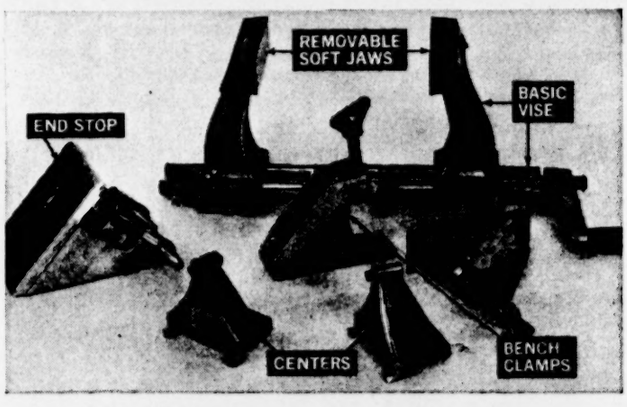
Zyliss Vise

This ingenious workholding system will hold just about anything short of a live cow in just about any position you could want. I'll confess to coveting one of these for many years, but most of the work we do is a bit heavy duty for the Zyliss. Too bad. The fine Swiss workmanship and versatility make it one of those rare satisfying tools that is worth its high cost. Not for blacksmiths, though it's amply strong for woodworking and modelmaking. Its best feature is the ability to grip large objects such as whole doors. We may yet get one . . . .

— J. Baldwin
[suggested by William Bastendorf]

Zyliss Vise
(they have catalog)
$79.95 postpaid

from:
Clark Products
1002 W. Gladstone
San Dimas, CA 91773



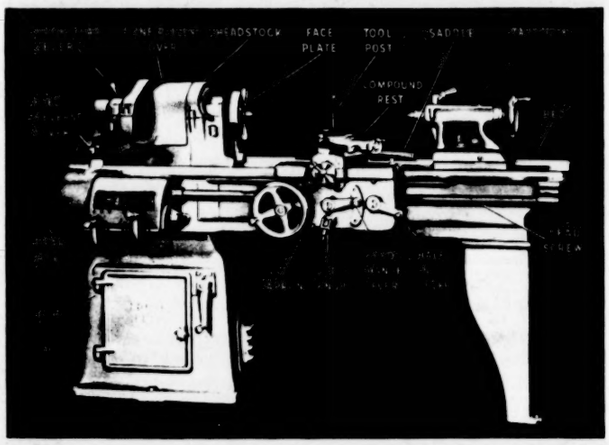
How to Run a Lathe

Lathes are great. I've got one made about 1910. Cost a couple hundred and took a week of work cleaning it up and rebuilding it. It's at least as good as a new one costing $6000.

I've look at a lot of books on lathes and this one covers all of it. I've been reading it for a year now and there are still things in it I haven't learned. Get your copy quick. It may not be available forever. Oil and clean your lathe a lot. Lots of lathes get ruined by not being oiled.

— Fred Richardson

The Care and Operation of a Screw-Cutting Lathe
Available in English, French, Spanish, Portuguese.
South Bend Lathe
1914-1966; 128pp.
$1.00 postpaid
from:
South Bend Lathe
400 W. Sample Street
South Bend, Indiana 46623
or Whole Earth

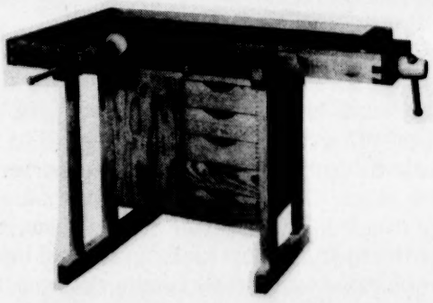


Sjoberg Workbench

I've heard that some people keep these beautiful benches in their livingrooms, and it's obvious why when you see one. They're gorgeous, designed with rare competence, and (inevitably) expensive. It would be a shame to bung one up working on it, but I suppose they age gracefully as they accumulate the scars of service. (Similar benches available also from Brookstone (CATALOG p. 142) and Woodcraft Supply (CATALOG p. 146).)

— J. Baldwin

Sjoberg Workbench
(Model 142) (It also comes in other models and sizes.)
$250.00 F.O.B.
from:
School Products Co., Inc.
312 East 23rd Street
New York, NY 10010



Ways of the Sierra Madre

A loving, beautifully illustrated book celebrating the methods used by rural Mexicans in their everyday life.

— J. Baldwin

Ways Of The Sierra Madre
Eugene H. Boudreau
Illustrated by Joe Jaqua
1974; 96pp.
$3.00 postpaid
from:
Pleasant Hill Press
2600 Pleasant Hill Road
Sebastopol, CA 95472
or Whole Earth

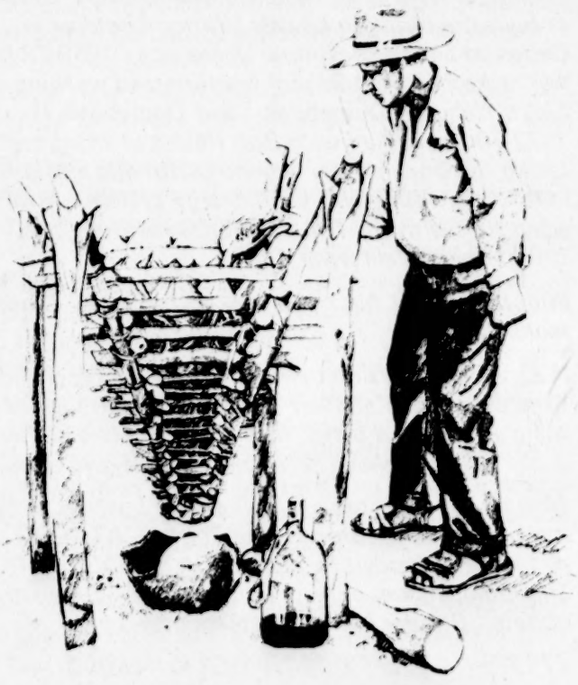
[Note: an item called "La Mecha" on p. 111 of the Winter CQ was from this book.]

The soft brown soap *(jabon)* made by boiling together animal fat and lye leached from wood ashes has unknown beginnings, but was in use at the time of the Roman Empire. Besides being used for bathing and washing clothes it is a good shampoo for the hair, and its crude manufacturing process in no way detracts from its efficient cleansing properties.

Soaps are the salts of fatty acids that occur in natural fats and oils, and soap-making is based on the reaction of a caustic alkali with fat or fatty acid. The caustic alkali used in making *jabon* is caustic potash or potassium lye (KOH). *Jabon* is soft because it contains glycerine, which is separated out in most soap-making.

Some ash yields stronger lye than other, with ash from *bledo* or *roble blanco* (white oak) being two that are preferred. Ash from corn cobs or *palo blanco* is also good. *Bledo* is a wild plant that has a straight stalk several feet high with a pithy center. (Tender leaves of young *bledo* make a delicious green that is either fried or boiled in a soup.)

Leaching of the ash is done in a bin made of sticks and palm leaves called the *estiladera* . . . .



One Highly-Evolved Toolbox

BY J. BALDWIN

James Tennant Baldwin, 41, is the chief evaluator for the Soft Technology and Nomadics sections of **The CoEvolution Quarterly** *and* **Whole Earth Epilog.**

Everyone who has dealt with the man and his tools (they are inseparable) grows a certain awe and curiosity about them. Herewith, some answers. Calling his toolbox "highly-evolved" I mean:

- *It works hard. Tools that break are long gone.*
- *It travels incessantly. Tools that don't earn their keep have been resold or given away.*
- *It shops incessantly. What's new and good joins or replaces what's old and good.*
- *It has experience. Time plus application equals wisdom. Excellence acquires a recognizable glow.*
- *In cybernetic summation: form follows function: the more function the finer form. (The other side of that statement is — Use It or Lose It.)*

As for J.'s end of the user/tools CoEvolution, he was an undergraduate of the University of Michigan and did graduate work at the University of California, Berkeley. In 1952 he had the 8th Volkswagon in America. He first worked with Buckminster Fuller about that time. 1955-57 he was in the Ski Infantry in Alaska. 1958-62 with Bill Moss Associates working on such advanced camping equipment as the pop-tent. 1962-68 he was teaching design at San Francisco State College. San Francisco Art Institute and Oakland College of Arts and Crafts, simultaneously. 1968-69 at Fuller's invitation he was Visiting Lecturer in Design at Southern Illinois University. 1969-72 he was at Pacific High School teaching and working with Lloyd Kahn on **Domebook I** *and* **Domebook II.** *1972-74 he worked with Bob Reines at Integrated Living Systems in New Mexico contriving a totally independent solar and wind energy system. Nowadays he's with us, The Farallones Institute, and University of California, Davis.*

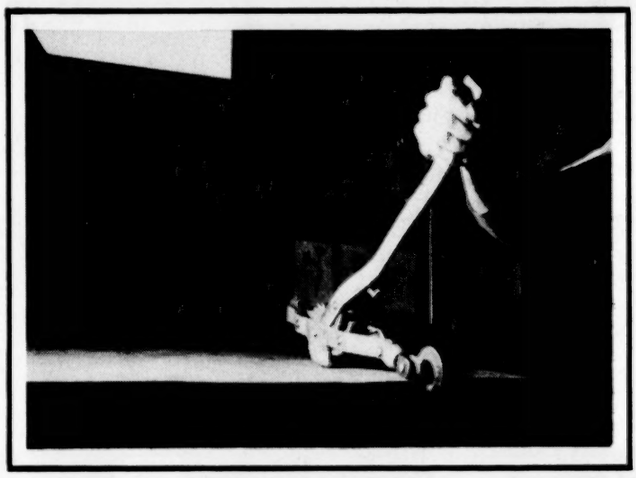
With his skills J. has never looked for a job. Work looks for him.

A significant portion of what calls itself "J. & K. Enterprises" is Kathleen Whitacre, 25, who is pursuing a biological bent. In their six years together J. and Kathleen have been apart maybe two days?

How to get these tools? Mail order, J. writes to the manufacturers or Brookstone Tools (CATALOG p. 142), or Woodcraft Supply (CATALOG p. 146). Shopping, J. goes only to commercial and industrial outlets. Regular hardware stores never.

— SB

As thing-makers, tool freaks and prototypers, Kathleen and I find ourselves custodians of about a ton of versatile hand tools. These have been used by us and friends over the years to help many projects and repairs get done. People keep asking us what tools to get, where to get them, and how to keep them from getting ripped off. Well. . . here goes.



COME-ALONG
It's surprising how often this thing gets used if you're living in the country. Lifting engines, hoisting sheep, unstucking cars in the mud, dragging loads into trucks, straightening sagging sheds, stretching fence, moving things over just a little. . .

Stand in Sears Tool Dept. and it'll soon be obvious that you don't need one-of-each even if you have the money. Ask a craftsman what to buy, and you'll get as many answers as people you ask, for each has their own favorites and specialized needs. They'll all agree on one thing though: BUY THE BEST YOU CAN. And the more a tool will be used, the better the quality should be. Tools used every day, especially electric tools, should be of commercial or production line grade. You usually can't find these at hardware stores. Industrial supply houses are where to go. Take a friend who can buy wholesale. These tools will be expensive, so we'd better justify the cost.

For many, the best reason to go first class is that good tools are a real pleasure to use and handle. This helps make work less labor. The heavy duty stuff looks brutal. It wasn't made to look good in the box, it was made to do the job and has been perfected over many years. The tough ones have their own kind of beauty that you'll see better as your viewpoint gets aligned with reality. Such tools, of course last longer and are repairable when they finally do wear. They

BOSCH TOOLS

Note how this drill fits my hand, putting my weight directly behind the bit. It's the only drill we've seen where your hand doesn't cover cooling slots. Smooth and super powerful, these drills last a long long time. They are also double insulated which makes them a lot safer, particularly outdoors.

The Bosch jigsaw is merely the best there is. Ask anyone who has used one. My only regret is that I waited 5 years to get one, and made do with a poorly designed domestic commercial grade machine whose bearings failed regularly and whose handle soon got too hot to hold. (Sears best grade jigsaw is more versatile but not as high quality.)

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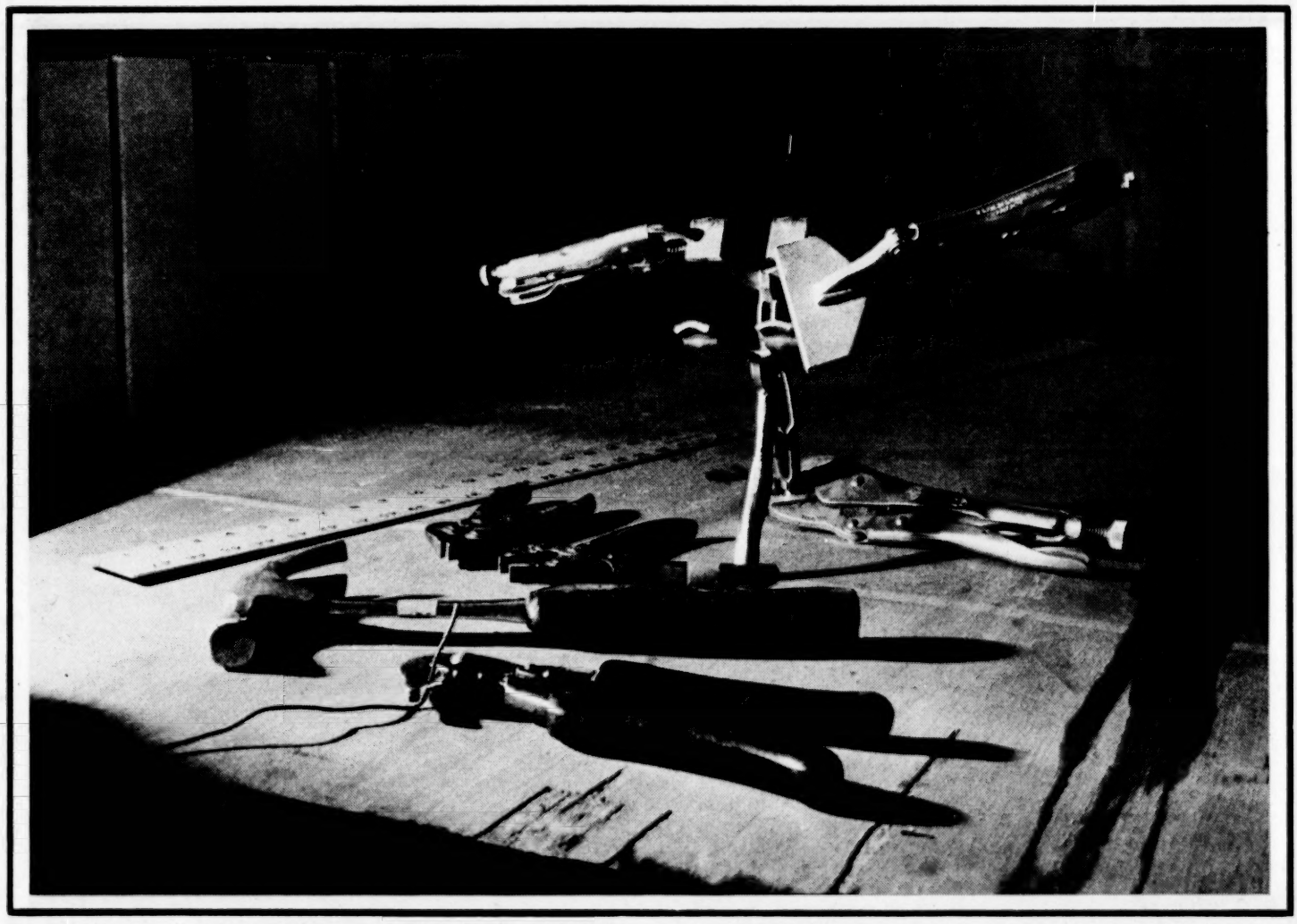
can take a lot more abuse, especially the inevitable overload. They can handle the bigger jobs and poor working conditions that would soon trash cheap versions. And after a few years in your hand, they often get to be old friends.

For tools that get used now and then, middle quality will do. By that I mean Sears better grades and no lower. Really cheapo tools are of no use at all, can be dangerous, and often break the first time you use them. They are also discouraging to use, which might even cause a beginner to give up. Our only regrets have been not buying the best when we could have. Tools that receive great strain, such as gear pullers, should be super top quality only. If you only need one every five years, rent it.

OK so what tools do you need? How do you start the stash? There are a few basic tools that everyone should have available: Hammer, crosscut saw, adjustable wrench, pliers, screwdrivers (get a set), tape measure, hand drill and bits. Beyond these, you'd best gather tools as you need them. Auto work will require a rather complete set of wrenches and a whole boxfull of special tools, some of which are for particular vehicles. Carpentry will require another whole group: planes, chisels, etc. Electrical and plumbing still more. Our rule of thumb is if we need to borrow a common tool more than once, we buy one.

Fleamarkets are a good place to look for expensive items like vises or anvils. Absolutely the best place to get a whole mess of tools at once is to keep alert for a widow selling off her deceased husband's retirement shop. Another place to look is auctions, but you'd better know what you're doing. You should shop around. Recently in the Bay Area, we were quoted prices varying 50% on a tool we wanted! If you want to buy a bunch all at once, (which makes sense these days of inflation – tools are a good savings account), some stores will make you a 20% deal. Even Sears can be dealt with, as the sales people work on commission. They and other stores also have unadvertised freight-damaged goods hidden away. These can be good deals, as the damage is often merely cosmetic. You can give a salesman your name (and take his card) and have him call you when a certain tool is on sale or arrives damaged. *[more →]*



BIRDHEADS
If you do a lot of work with heavy wire, these are just the thing. Compound levers let you snip through most wire like it wasn't there. Nose makes working overhead easy.

4 FOOT RULER
If you work with plywood or 4x8 anything, one of these will save you lots of time and grief. NB. Some new plywood isn't 90° square!! Check it always.

STEEL HANDLED HAMMERS
Steel or fiberglas may not be as aesthetic as wood, but the heads don't fly off when dry weather shrinks the handle. Violent nail pulling won't break them either.

VISEGRIPS
Buy these by the genuine name Visegrip. They come in an array of sizes and jaw shapes, allowing you to grab what you see with a grip strong enough to crush things. Handy for undoing old rusty machines, and as a portable vice for welding, etc.

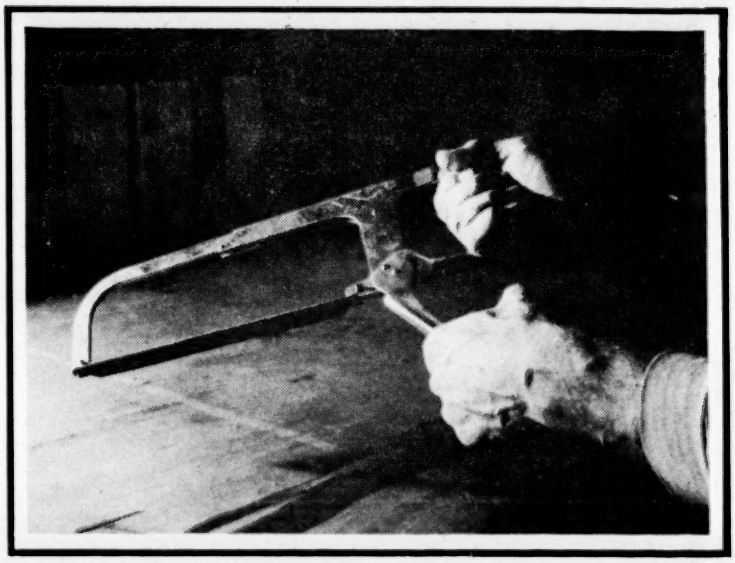
"BERNARDS"
Pliers whose jaws work parallel (there's a nifty wire cutter too). We often use these in pairs for twisting and shaping small parts and glass breaking. Our most pilfered item too; we've lost a dozen pairs. I can see why.

Whether in a Big Store or private sale, you should critically inspect each tool for condition. These days, many new tools by reputable (?) manufacturers are faulty. Used ones may be worn beyond repair. Anyway, be pickynit about it; you'll be living with it in your hand. And beware of package deals claimed to be a great saving. The "complete mechanics tool set for $450.00" often includes tools you don't need, and may force you to take inferior items that you would be better off picking up individually.

What do you do about that little voice that whispers, "Buy one, you might need it someday!" Well, it's possible you'll be needing them all someday, but Sears is only the tip of the iceberg. Have you ever seen a real hardware catalog? 2000 pages? On the other hand, if often does pay to get a set of tools that greatly increases your capability, such as a welding rig. Another way to go is for a group to buy a set of tools for working on one particular item, such as old Chevy 6 engines, and then everyone in the group that needs a vehicle gets one that uses that engine and hence those tools, and the consequent parts pile. (That's being done around here. There must be dozens of 56 Chevy pickups and flatbeds within 30 miles.) Some groups get known for specialties: "the Butterfly Mountain people fix tractors." Some communities and families pool their resources and buy a set of expensive heavy duty tools maybe for tractor repair. You have to be pretty

AUTO-PUNCH

Instead of having to beat on this punch with a hammer, you just press it. The smite is adjustable, making it ideal for fine work and sheet metal layout.

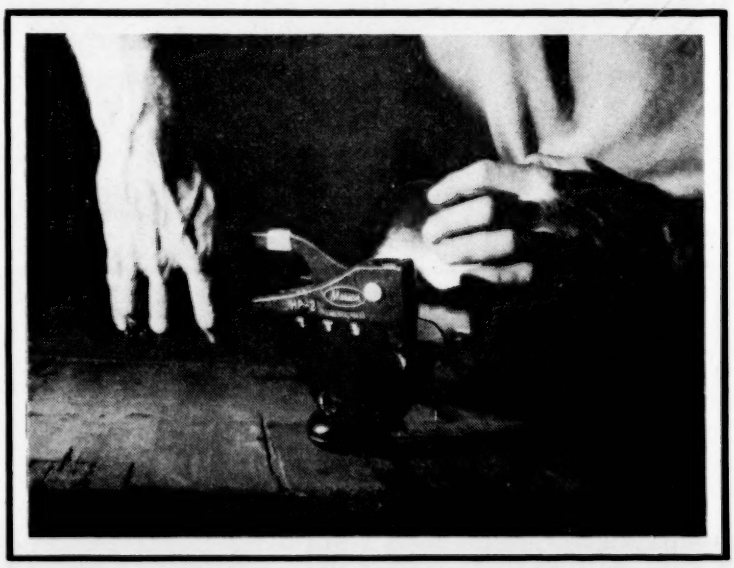


MILLERS FALLS HACKSAW #300

Lever makes blades super-tight in seconds without diddling little wingnuts. Blades last longer, and you can change blade type and position easily too (and thus do) and things go much better.

WHITNEY PUNCH

A fine punch set that can handle heavy leather and sheetmetal. We use it a lot in conjunction with the Popriveter.



POPRIVETS

We use Poprivets for lots of things. Especially good for repairing sheet metal (as in car bodies) where welding isn't practical. They'll work in leather, Masonite, plastic, too.

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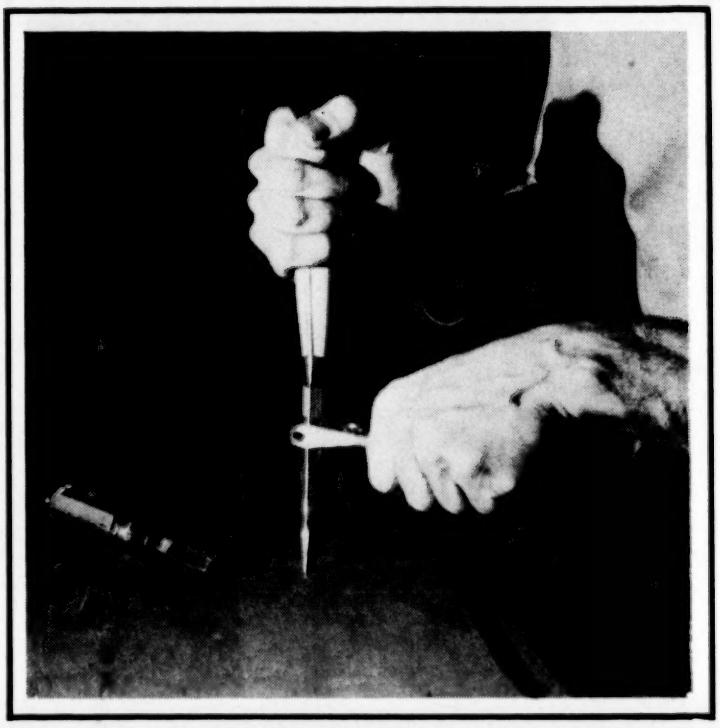
mellow to make this work, especially if there is a high turnover of people. But this is a growing trend, and we think a good one. It leads to barter and lessens the need for duplicate sets of specialty equipment.

Our shop is known for its versatility. It's portable; everything fits a 4x5 U-Haul trailer. It's been set up in ten different places in 5½ years. The tools were chosen for quality and versatility. With versatility goes a handy ability to work in harmony with other tools, enhancing all. For example, with the drills and vises we have, we can drill a hole at any angle in just about anything. The combinations allow us to easily mass-produce parts like dome struts of Inkle-loom frames. This gives a nice potential for making money as well as greatly easing tasks that might be as bad as working in Detroit. Versatility also means needing fewer tools which means less money out, less space for storage, and less tools to keep track of.

For many people, the biggest problem with tools is keeping them together. That was our problem too for awhile, especially at Pacific High School where there was always a number of young people who didn't yet see that tools are in a different category than other possessions. Our answer has been to take the time to try and give people a good feeling about tools being extensions of their own hands, and that tools are the means to getting good shelter and other desirable results. A French poet (whose name I

BANDIT
Designed for making hose clamps on the job, this tool can be used for banding just about anything with a variety of band sizes and metals. This was used to make dome hubs (See Domebook 2), band concrete forms, secure crates, make barrels, extend tipi poles, repair broken spars on sailboats, reinforce porch railings, etc., etc.



FAT SCREWDRIVERS
Big handles, heavy blade, compact size, make Sears #41586 and Irwin our favorite screwdrivers. Square shank allows help with wrench. You can't own too many screwdrivers, as they grow legs easily, and there are so many screw sizes.

NEEDLENOSE PLIERS WITH SPRING (left)
The spring and delicate jaw shape permits very delicate nabbing. You can actually pick up a live ant without damaging it (physically, anyway).

IMPACT DRIVER (right)
(Craftsman #9 GT 47634) This works like those air operated tire wrenches in garages except the power in this case is your hand. This tool is often the only practical way to loosen rusted screws and bolts on older machines. Wear goggles and gloves while using. Comes with several different bits and can be used with air drive socket wrench sockets too.

Not pictured

GLOVES & GOGGLES
The goggles save your eyes. The gloves (leather) save your hands and let you add double power to screwdrivers and snips.

TEFLON COATED SAW
Disston crosscut saw slices through green 4x4's and plywood with uncanny ease due to coating. Ours still looks good after 5 years. These saws play nicely with a bow too. Crummy handle can be sanded to a better shape.

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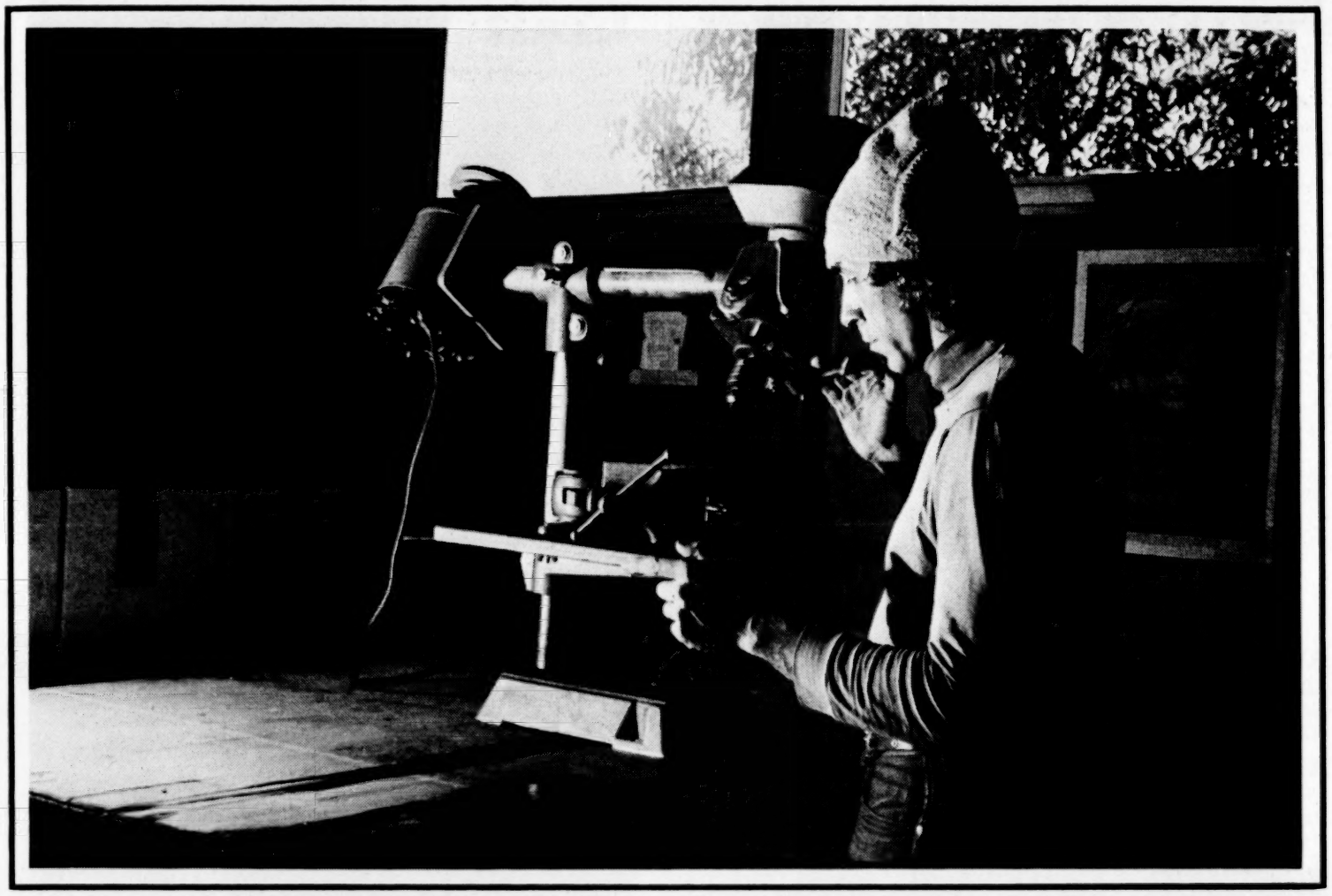
regrettably can't remember) said, "Hammers spend a lot of time sleeping. . ." We like to see the tools at work. We show people how to use the tools and encourage them to in turn show still others how. Having good tools in the hand, together with that tasty feeling that comes from teaching somebody else, gives the tool borrowers a respect for the whole bit.

We also have all the tools marked with a colored stripe. This not only reduces arguments on job sites where lots of people's tools are at work, but it makes it easy for people of good heart to return strays. We put out the word: "Bring a blue stripe tool to breakfast" and we round 'em up. We also ask that tools be brought back at sundown unless needed that night. There's a place to bring them back to. This is essential. A casual pig-pen shop just can't keep its tools because there "isn't any there, there." As an experiment, we



ROCKWELL RADIAL DRILL PRESS
Our most-used tool, bar none. This ½-inch drill can extend to drill a hole in the center of a 32" circle, and can swivel out to drill big things sitting on the floor. It can drill at any angle, including horizontal. Though not of machine shop accuracy, it will do 99% of the work most people will ask of it. Radial feature costs extra and is worth every penny. You clamp the work down (we use a Versa Vise) and bring the drill to it at the desired angle. We have it mounted on a box that holds accessories and brings typical drill table height to that of other shop benches so we can support long objects being drilled. Dependable too: no repairs in 12 years. It's light enough to carry to a big job.

VERSA VISE
These wonderful vises can stand up, lay down, swivel, and come with a clamp base that you can take to the job on the third floor. We have two, and a number of bases (one on the drill press table), allowing us to grip just about anything you you could name short of a dead sheep in any position. They can be used as clamps when removed from base, a 1-second operation. Come with pipe jaws, too. Not for heavy metal work or heavy pounding.

---

abandoned our collapsed old bureau toolbox and bought a (freight damaged) Sears (the best for the money) rolling mechanics tool chest like you see in big auto shops. We segregated the tools by function and labeled the drawers. The result is that tools are easily looked over and selected and just as easily put to bed. To our great surprise, we found that this chest caused a drastic increase in the number of tools being used and a similar increase in action. We even found that we were using our own tools more! The neat storage made it easy to see who was missing, but people brought them back much more reliably than before anyway. The chest can be locked to control unannounced borrowing which is always a disaster. The overall effect has been that under very poor risk conditions, both sociological and physical, we've only lost about $50.00 worth of tools in 5 years! And this without having to get too heavy or "high school shoppish" about things. In case you wondered, we did try the toolboard-on-the-wall. It didn't work, and nobody we know that's tried it has made it work either, though it is nice to see all those tools hangin'. It has not been necessary to sentence anyone to being tool crib librarian either. We'll admit that it takes some time to develop tool-consciousness in a crew, but it can be done, and peaceably. The tools spend a lot less time sleeping too.

There follows here a list of a few of our favorites. Other brands we like a lot are "Snap-on" wrenches, "Diamalloy" snips, "Estwing" hammers, "Kraeuter" pliers, "Channellock" wrenches, "Nicholson" files, the professional tools made by several domestic manufacturers like Stanley who also make junk. Think of tools as extensions of your hands. They should feel like that. ■

Costume Patterns and Designs

Scanning **Vogue** *for sewing ideas can be demoralizing. But I've heard that famous designers rely on this book for inspiration. Essentially no text; several hundred color plates of traditional garments from all over the world, drawn so that their construction can be understood.*

To translate the ideas into clothes, a basic ability in pattern drafting is needed. Then get a bunch of muslin or old sheets; open the book and consider your experiments an education in design.

— Rosemary Menninger

I'm no clothes-horse, but this book makes me gasp and covet.

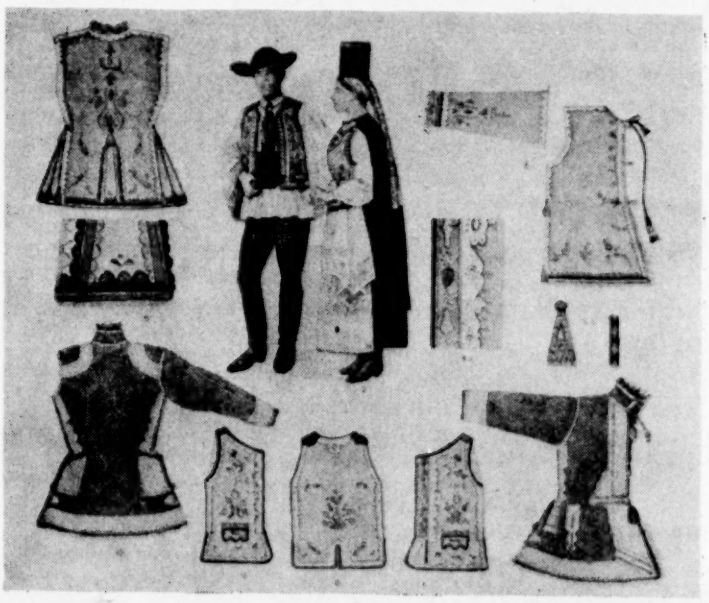
— SB

Costume Patterns and Designs
Max Tilke
1956; 158pp.
$44.00 postpaid
from:
Metamorphosis
1980 Union St.
San Francisco, CA
94123
(A. Zweemer Ltd.
London, England)

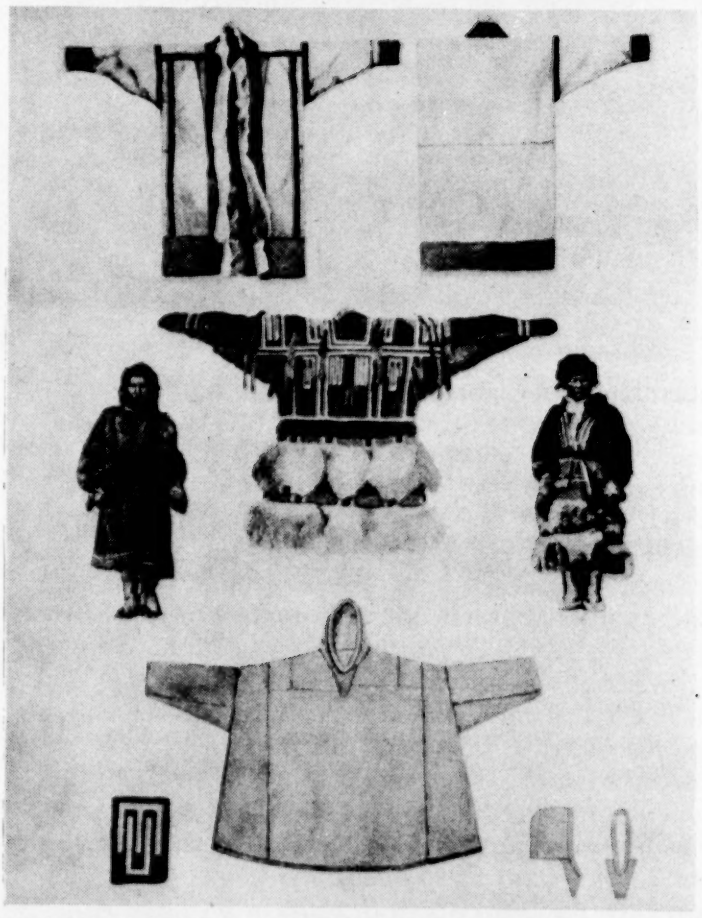
Craft

Tibet

In examining a garment one should first note those seams which are in any way emphasized or stressed by ornamental decoration, disregarding those which have arisen accidentally or through lack of material. Then the shape of the sleeves should be observed, the kind of neck opening, the fastenings, trimmings and colour. The garments of the earliest epochs are the most simply cut and show the fewest seams. Complicated garments may be reduced to a characteristic core which remains when all decoration, indicated by seams, is removed.



Rumanian influence on South-Slavonic costume



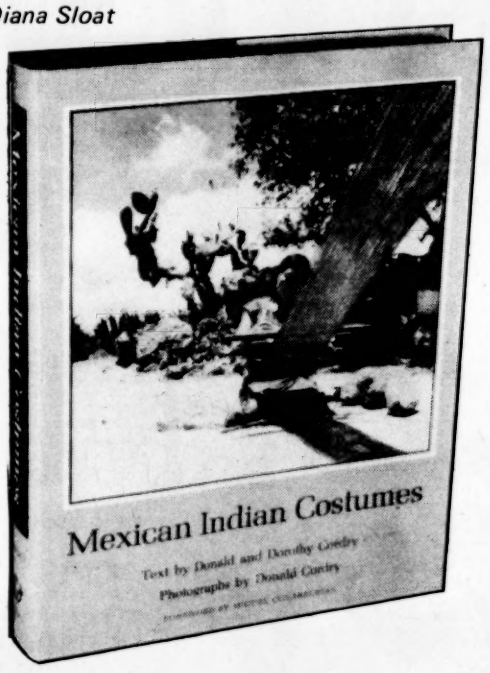
WESTERN SIBERIA: Ostyaks and Samoyedes

Mexican Indian Costumes

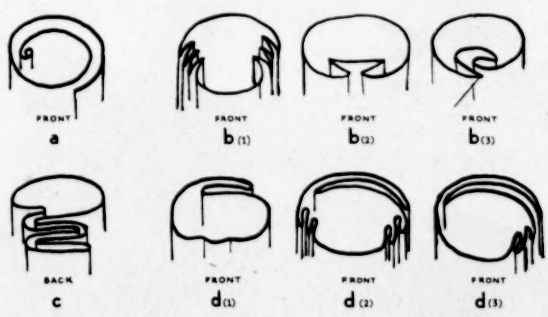
A powerful & compelling book. The photographs capture the beauty of the textiles and the dignity of the people who make and wear them. The text provides a loving and careful treatment of the textile arts and their place in the lives of 24 separate Indian cultures, some already vanished and others fast dying. Interlaced with mythology and history it encompasses tools and their use, materials and how they are gathered, and the infinite variations in design and function of the finished pieces across all of the cultures.

A book I go back to for peace of soul, for design inspiration, for technical information, and to experience kinship with those for whom weaving is viewed not as technique but quite literally as part of the fabric of life.

– Diana Sloat



Mexican Indian Costumes
Donald & Dorothy Cordry
1968; 373pp.
$17.50 postpaid
from:
University of Texas Press
P.O. Box 7819
U.T. Station
Austin, TX 78712
or Whole Earth



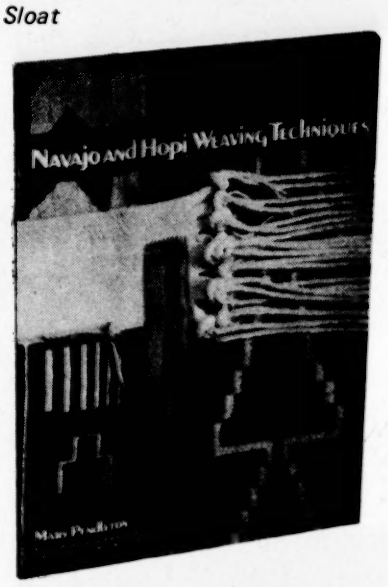
Various methods of assembling wrap-around skirts.

A Nahua woman of Cuatlamayan, San Luis Potosi. 1965

Navajo and Hopi Weaving Techniques

Technically, though not in beauty of spirit, Mary Pendleton's book replaces Working With the Wool *(EPILOG p. 563) as the best beginning Navajo rug weaving book. Years of teaching experience back the clearly-stated, efficient instructions for carding, spinning dyeing yarns and warping, weaving and correcting common mistakes. Each step is photographed clearly. Also included are sections on loom building, Hopi methods of belt weaving, sash weaving and spinning, and suppliers' lists. So, experienced or no, buy the materials and you're into it!*

– Diana Sloat

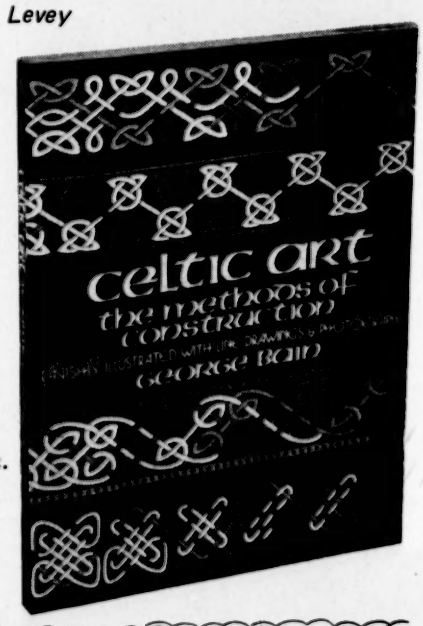


Navajo and Hopi Weaving Techniques
Mary Pendleton
1974; 158pp
$4.95 postpaid
from:
Macmillan Pub. Co., Inc.
Order Dept.
Front & Brown Sts.
Riverside, NJ 08075
or Whole Earth

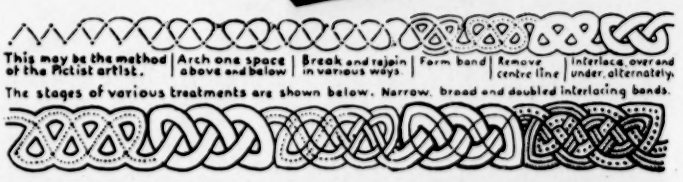
Celtic Art

This is one of the most inspiring sources of design I've seen in a long time. Bain gives you step by step instructions for designing your own incredibly intricate interlaced borders and panels, spiral designs, key patterns, zoomorphic and anthropomorphic designs in the Pictish-Celtish tradition. For the fainthearted and the unoriginal, there are also hundreds of patterns you can copy. Marvelous source of patterns for embroidery, weaving, wood carving, silver and bronze work, leather tooling, and just about any other craft.

– Jack Levey



Celtic Art:
(The Methods of Construction)
George Bain
1973; 159pp.
$4.00 postpaid
from:
Dover Publications, Inc.
180 Varick St.
New York, NY 10014
or Whole Earth



You feel good
All day Everywhere
Maybe for the first day
Of your life.

ZEN PANTS

Brush drawings and words by Paul Reps
Photographs by Annie Leibovitz
Layout by Peter Bailey

"How far from your feet are you, anyway?"

Each step
Loses itself
In the next
Step

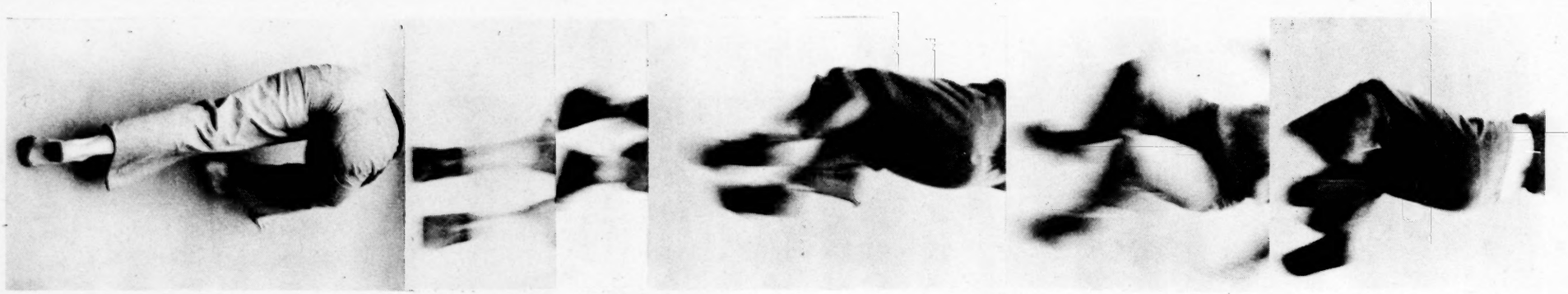
The more awarefullness
The less body weights
The more light
The less mind weights

They ventilate - -
Air blows up your legs - -
Very healthy.

May
Your
Steps
In-vent
You

FAT PANTS

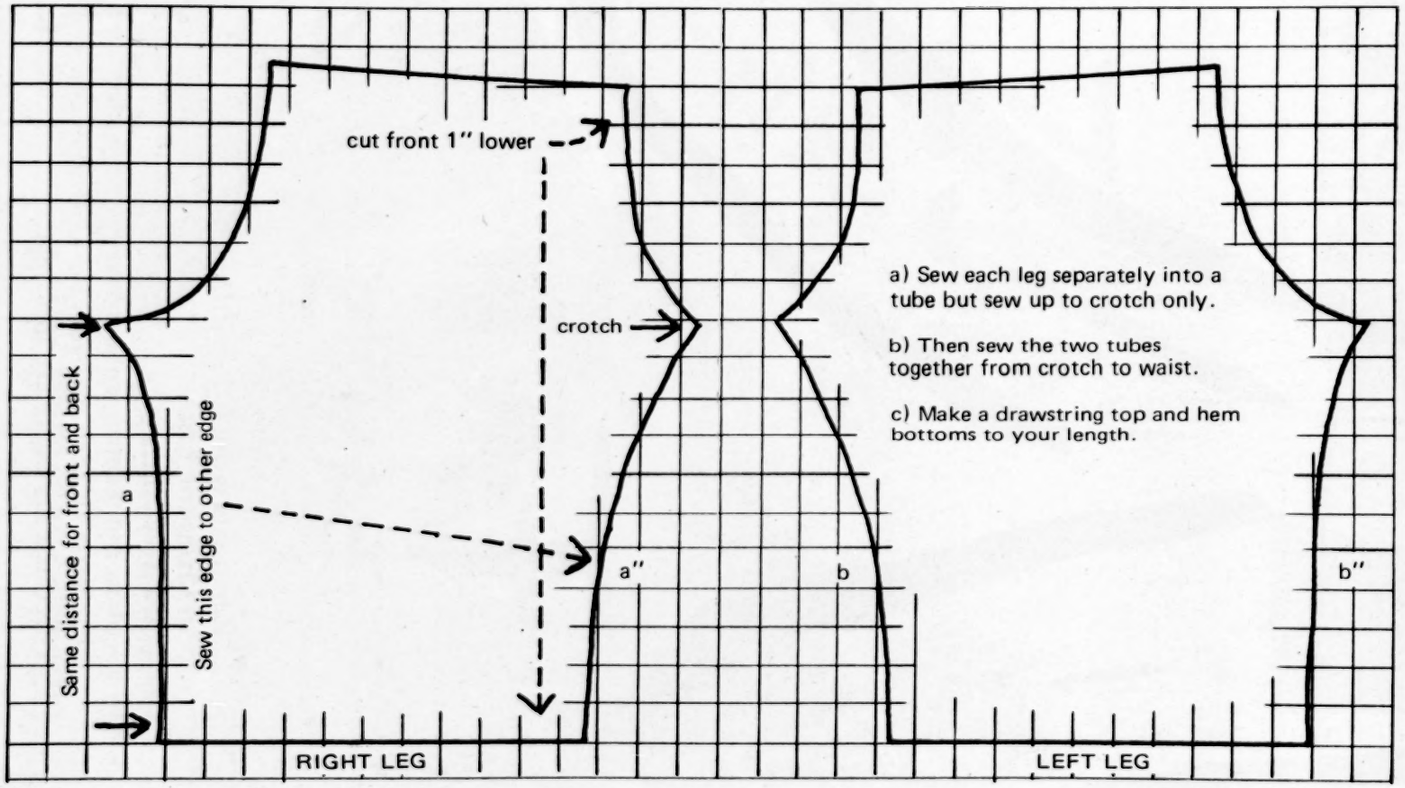
Zen pants worn for centuries
In China for in-joy
Are now yours.
Man, not woman, makes war
Because he feels uptight
Because his pants are too tight.



How do you like Your Zen Pants?

How to Make Your Own Zen Pants

Buy three yards of material to make them. Measure you, then cut much ampler than you for plenty of comfort.



a) Sew each leg separately into a tube but sew up to crotch only.

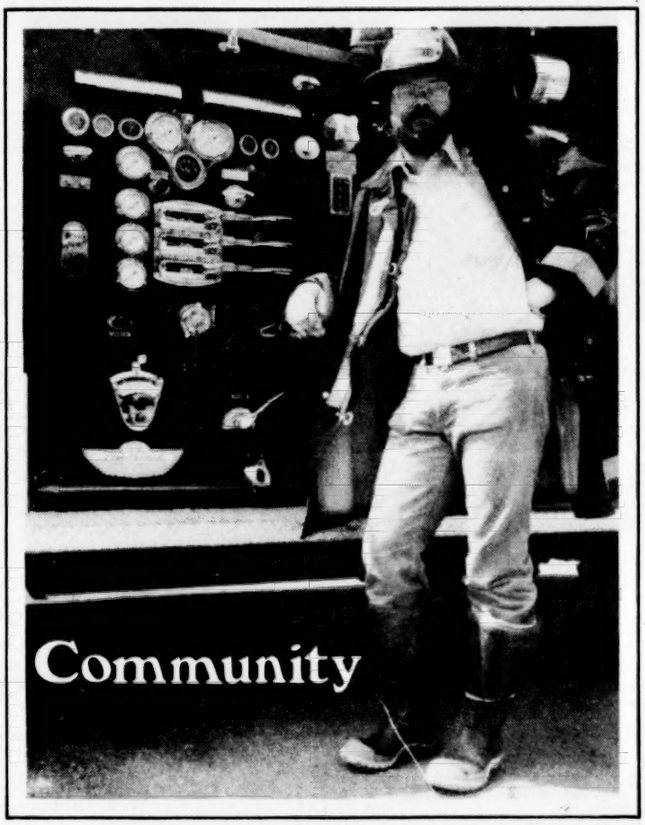
b) Then sew the two tubes together from crotch to waist.

c) Make a drawstring top and hem bottoms to your length.

ALAYA STITCHERY makes and designs these pants non-profitly peacefully. One pair of blue cotton denim with two pockets (where you want them) $21.00 postpaid plus $1.20 tax if living in California, price and fabric subject to change. Include measurement around waist, fullest part of hips and length from belt to ankle. Sent bottoms hemmed unless you want them unhemmed. Write for other fabric choices.

ALAYA STITCHERY
Zen Center
300 Page Street
San Francisco, CA
94102 USA
tel: (415) 863-0249

You're going to like them.



– *Maris Cakars*

FIRE BUGS: TWO REPORTS

The people who live in Rifton, N.Y., publish WIN (Peace and Freedom Thru Nonviolent Action). The people who live in Fort Edward have a recording studio (ZBS Media) and do radio and records (Abbie Hoffman, Bhagavan Das, Ram Dass).

Both are in highly conservative territory, and both plan to stay and do their work. On an Upstate trip I discovered that the Win people and the ZBS people had joined their local volunteer fire departments. Not only has it helped "community relations", but they also get to wear helmets, leap out of bed when the alarm comes two o'clock in the winter morning, and fight fires. We'll let them tell it.

–Rick Fields

WIN REPORT

There are 1,500,000 volunteer firemen in America, organized into countless fire companies, each with its own standards, traditions and problems. Fire companies in densely populated suburban areas have very strict requirements and long waiting lists of applicants. The smaller rural companies, on the other hand, often are short of manpower and are anxious to bring in new members.

My own experience is with such a rural company, the St. Remy (NY) Fire Department. Although the requirements for membership were minimal–– residency in the district, age, membership in the male sex–– the fire department also functions as a focal point of community life and, in a sense, a private club so suspicions were aroused when two longhairs applied for membership. What is normally a very simple and automatic process was drawn out over two months while the more militant right wing members searched for a reason to keep us out. In the end the opposition collapsed and we were accepted.

We had achieved our objectives of getting to know people in the community, getting a certain amount of recognition and, perhaps most important from our more or less anarchist perspective, we had involved ourselves in a cooperative effort towards a worthy end. Now came the tedious part: long boring meetings and regular training sessions (drills). In an area such as ours fires are fairly rare so after a while you get to wondering why you are spending all that time and energy. But there are occasional parties, parades, ball games, etc. which help keep morale up so we kept at it. Although they are not yet required by our fire department, we even took a number of state sponsored courses and learned quite a lot so that when there were fires we were able to make a real contribution.

A year after we were admitted into the company Brian, the other longhair, was elected lieutenant. This year I was elected to the same office after Brian declined to run again.

It's been fun and a good thing to do besides.

–Maris Cakars
Rifton, NY

ZBS REPORT

WE tried to join the local fire department for two years but we applied to the wrong person–– we got blackballed because of that hippy image routine–– it was a good thing because that company got no class as well as no beer machines in their building. That same year we all registered to vote which gave us 12 votes in our little community–– wow did we see action the coming election we had the different candidates from both parties come down to our house and explain their platforms etc. It seems our small island is the swing vote between the TOWN and the VILLAGE. When we were talking to the local politicos we told them of our desire to join a Fire Company–– two fold reason–– we wanted to get a fire engine in our area since we are a good distance between both companies and also we needed a way to water our garden in the summer–– the next week our applications were processed.

We had a little trouble with some of the brother foremen when we first joined–– the hippy thing–– even though at least ½ the members were long hairs (with a lot of red necks under their hair) but after a few fires and some drills we were pretty much accepted. We went to fire school which was on a voluntary basis and passed our basic training which gives brownie points to the company–– we started to help out on different fund drives etc. and were soon calling other longhairs hippys–– As it stands now it was a great movie–– we have been asked to join the baseball team etc. and are planing to enter the MUDDY WATER RAPIDS DERBY next week with our fellow firemen. Its like expanding the concept that we worked out with our local neighbors when we first moved up here–– we had to go out and work with them before the stereo type barriers were broken etc. I would have to say its one of the best things going for us up here not only because we can get all our frustrations out by chopping down somebodys house thats on fire but we also get the blue light on our cars that work well in keeping the local police types off our backs. As soon as we joined the local police new about it and seemed to get a lot friendler etc. Its realy far out now when we go into Town and the Mayor talks to us about all sorts of things etc we even got asked to run for political office but that much responsibility was a little to much and any way this is a hardcore Republican area and we are Dems and Independents with a Conservative thrown in for good luck. A typical fire meeting is run like a TOWNHALL MEETING and after it the bar is open and we sit around drinking beer and playing cards shooting pool or fighting fires. For any community of people who have gotten out of the cities it would seem a good link in your development plan to join the local fire company. We have gotten to know a lot more people than we would have by staying on the farm and in turn it has cooled out alot of people about us. A nice thing about it is that when we need something welded, fixed etc. we go to one of our local friends who will usually not accept money–– but we are always drooping off vegtables for them during the summer etc. as well as giving them plants from our greenhouse or helping them put up hay in the barn. Its that old system of sharing energy with out having it turn into green back phobia.

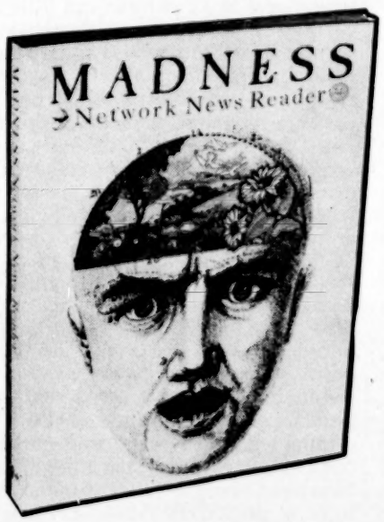
–Max

Madness Network News Reader

i've never gone crazy enough at the right time for somebody to grab my ass, lock me up, and pump me full of social drugs and electricity, so that i might be a milder member of modern amerikan culture. thousands of folks are sleeping behind bars tonight because they got a little wierd once to often, or let their mind shine through a little too strongly at the wrong time, or pushed a relative just a little too far.

Madness Network News Reader is a digest of the Madness Network News, *(EPILOG, p. 740) and represents the collected efforts of a few folks who are trying "to put an end to the degrading and alienating practices of the psychiatric system and to create instead a process that validates human beings and their right to express themselves." The Reader is a tool in that direction. It is full of scary things, funny things, crazy things, revolutionary things, all having something to do with the overthrow of the mind control industry. I think this is the book that will pull the media in on top of the Network, and begin to situate firmly in this country the movement to decriminalize craziness and provide alternatives to Bedlam.*

— J.D. Smith



Madness Network News Reader
edited by Sherry Hirsch, et. al.
1974; 194pp.
$5.95 postpaid
from:
Glide Publications
330 Ellis Street
San Francisco, CA
94102
or Whole Earth

1.
Lonely, hell!
I feel crowded.

4.
Sometimes Catatonia
sits with me for hours.

I do not speak to her.
She does not speak to me.

We communicate this way.

•

Atwake we keep our dreams of sleep
because we see life's seems are cheap.

•

As a Jew and as a psychiatrist I have long held a deep conviction that the attempted extermination of the Jews and the maltreatment of mental patients are somehow profoundly connected. But only recently did I come upon one of the best kept secrets of modern times: that German psychiatry began to discuss the extermination of mental patients before Hitler had been heard from, that German psychiatrists were the first to begin exterminating people in Nazi Germany, that they pioneered the gas chamber and crematorium, and that they were the architects and technicians of the Final Solution for the Jews.

•

THE TRUTH ABOUT ELECTRO-SHOCK TREATMENTS

A jolt of power jars you into the darkness of temporary death. It's a darkness you can't see or perceive. It's the equivalent of death, except you wake up again. You wake up upstairs in your cell and they feed you breakfast. It destroys some of the cells in your brain and erases your treasured memory. The war-criminal doctor gives you not one of these, but 15, and one guy got 100!

It completely shuts off the light in your brain to temporary darkness that feels like it lasts one day, but actually lasts about 20 minutes. It's horror!!

After my treatment, given to me because I punched an attendant, I couldn't even remember what my mother looked like and one patient couldn't even remember the names of his kids. One patient asked me if he "died" in the shocktreatment room. One patient said he got a "little glimpse of eternity and there's nothing out there." One girl after her treatment said "Where's my brains at, where's my brains at?" Yes, girls get shock treatments, too. Once, in Montana a patient DIED on the table, and never got up.

I lost my treasured memory, and much of my mental ability. I used to be good at mathematics, now I am just mediocre. I used to be the best Bridge player at a hospital, now a retarded patient plays better. I used to be able to memorize all the cards in a Pinochle game, now I just coast through. I used to be good at Art, now I quit because I lost the knack. Now I am always forgetting things and I used to have a good memory. I'm stopped at getting choice jobs and professions. (The treatments give you Epilepsy, too.)

And every doctor applying electricity to the flesh knows it harms. His sins are seen by the Skies, and by himself. He's worse than an Auschwitz fanatic.

•

What are the real issues? "I don't like what you are doing, stop it . . . and this is what I'm going to do if you don't." If more people said that and meant it then there would be less need for psychiatric hospitals to do other people's dirty work.

Lap Game

Dear CoEvolution,

The New Games Foundation and the Women's Center at the University of California at Davis issue a joint challenge to any group to break the World's Record for the Lap Game. This record was set on November 9, 1974, and to date is unbroken.

The start of the lap game is one person laying on their back with their knees up and together. A circle is then constructed with people sitting on each others' knees and completing the circle. New Games and the Women's Center will consider the record broken when two counting referees and the person who laid down at the start sign a certificate swearing positively that the circle was complete. As conclusive evidence a photograph of the event should also be submitted. (Wide angle lens recommended.)

Pat Farrington
New Games Foundation
200 Clara Street
San Francisco, CA 94107

Donna Moore
Women's Center

Running shoes

Dear CQ/Epilogue:

Running Shoes. Most are made elsewhere, but New Balance are made in U.S.A. Most are one width. New Balance are made in YOUR width.

New Balance Athletic Shoe, Inc.
176 Belmont Street
Watertown, Mass. 02172

I bought my first pair of Trackster III's in April 1974, and they are still going. Soon, though, I'll have them resoled at the factory, the only company I know of that does this. No more throw-away shoes! I've also had many miles of virtually injury-free running thanks to these shoes (runners know what I mean).

The mail order service is fast (they have immediate delivery on all styles, not like others who have limited and spotty supplies), but when ordering, send a tracing of BOTH feet and the size of your street shoes. If you don't like the fit, (and if they don't feel right as soon as you put them on they don't fit right), tell them why, and exchange them or get a refund. They're guaranteed. Catalogue and price list enclosed. Thanks.

Trackster III $25.75

Sincerely yours,

Thomas A McCarey
"Joe Foot"
Berwyn, Pennsylvania

Miller Barefoot Freedom Shoes

Old lady shoes — sensible, sometimes even snazzy-looking. The brand of shoes Eleanor Roosevelt wore all over the world; and considering the comfort, workmanship and durability, they're practically cheap ($30 - $40). More than 30 different styles. Write for a catalog and address of nearest store. Visit the store once for a fitting — the sizing is slightly different than regular shoes. From then on you can order by mail. Allow 4 months delivery.

The boots ($40 made to order in basic colors of leather or suede) feel like champion ice skates.

— Rosemary Menninger

Miller Barefoot Freedom Shoes
Miller Shoe Co.
4015 Cherry St.
Cincinnati, OH 45223

Jerusalem: Innerviews

BY S. N. DURKEE

Stephen (Noor) Durkee spent last Fall, August-December 1974, prowling the innumerable interfaces of Jerusalem. He's an artist. The eagle and mountain cover of the Winter CQ *is an example of his work. (If you check the snap biography of Durkee in that issue you might add what I left out, that nearly all of his books, communities, and other accomplishments listed were group efforts. So is this article. So is this magazine.)*

From Steve I learn what I never got before — how family-size the Mideast conflict is. It's a tiny area. The Jewish sons of Isaac and the Arab sons of Ishmael continue their brother feud over who gets father Abraham's inheritance, legitimate-born or first-born. In Israel western technological (re)invaders displace the complex native culture in a Cowboys & Indians rerun. Irony grows too thick to cut — Jewish stormtroopers and desert nomad billionaires. The outside stakes too multiply in value; that's the perspective we usually get, which this article may help balance.

The core of the story is the oldest and simplest. Share or destroy.

— SB

It is difficult in both the East & the West to get a very clear picture of what is occurring in Jerusalem. One reads the papers, watches TV, scans thru the opinion news mags, but none of it really gives you the story. We know that what happens there invariably has an effect on the world out of proportion to the size, population or importance of the actual place especially in terms of the events which have grown out of the last outer rumble known as the Yom Kippur War which led to the oil embargo & subsequently to a total realignment of the entire world economic & political picture.

Beyond these present-day considerations it remains a continual reference point as a major focus of religious & spiritual feelings for the three interrelated monotheistic traditions, as the Jew, the Christian & the Muslim consider it to be a sacred city.

> God was pulling our legs I feel here when He allowed Muslims & Jews & Christians to have such very special places in which they are held in their spirits & minds. You see the Western Wall, the Dome of the Rock & the Holy Sepulcher, all within a kilometer — & you see on the level of the establishments we can't quite see why the others are here; we all wish officially that they weren't. . . .
>
> *— Murray Rogers, ecumenical Christian*

And in some sense it is for each a source point for certain cosmic insites & human values that have spread thruout the planet affecting both the legal & political systems & charters of world governments as well as shaping the communal religious life of a vast segment of the world population.

> I can see the point in having those buildings, because for sure, whenever I go to the Wall, whatever reason it is, even that I see the Wall is full of

letters, I always get some kind of sensation there. . . I'm feeling very much part of the history & in a funny way, I mean its not like I'm an important part — it is good that I'm part of this history, just a part of it & when I won't be here any more that it'll go on. It is like having an infinite root into the past, right to the beginnings of the people.

– Offra, sabra

The city has had many names over its long history, but the one it is most well known by is Jerusalem, meaning the place of peace, which seems at first on the basis of facts to represent a study in the law of opposite effects. A city known as the place of peace which has been in almost continual conflict during its 4000 yr plus history, alternately dwelling in the sphere of one world power & then another, or the West & then the East & then the West most recently under the British & the East under Jordan & then subsequently the new state of Israel whose ideals were & are Western in both form & content, economically, politically, & even religiously.

What is happening here is somehow connected with the return of this people to this land. And this involves the tragedy of the people being moved. At first they were buying the land, paying a good price, even paying the homesteaders. Everyone remembered Abraham bought & bought. But what happened afterwards is not all simple. . . The question is whether it's just one more nationalist movement — in a world that's getting tired of nationalism — in which case it's not worth it — or whether it is indeed a return ordained by God thru his servants the prophets. . . It's not the same as at the time of Joshua — the people here are not idol worshippers. We have to understand our relation to the Christians & Muslims. . . In any case it should be done in a way to minimize suffering. We just have to pray more I guess.

– Moishe Klebenov,
Torah scholar & teacher

Since I brought up until today, I didn't find myself. Just always I saw a shape of a man that the others want him to be as they want. Also I didn't find my people, who are out of their country. What I saw was the action of King Hussein against my people, the action of the Israelis against my people. So if I have the choice I will choose my people to make my government. . . .

– anon. young Palestinian, father killed in 6-day war, mother injured, some family in jail, 2 brothers killed in Jordan

All the time that the linear history continues it remains out of time, a place of gathering, of pilgrimage, of longing for & idealizing of, a place where somehow if one could enter in one would know something or be in some way changed from what one was. A miraculous city where miracles do occur, a city not quite of this world the way Chicago or London or Tokyo are. But a holy city, a city set apart, where the temporal merges into the eternal & eternity is every day. A city that kills its prophets.

. . . it is such a place. Is it healing? No sometimes it makes people worse. I have seen some people who became healed here, but then I know others, who died here.

After some time when you are living here you are not astonished any more of anything. . . Now I won't say that every person here is slightly mad — I would say there is something very attractive & the city is exceptionally tolerant to old people of all kinds. It's not a new thing but the city was always packed with dreamers with madmen with persons who went to search for something — found it or didn't find it. . . .

– Rabbi Adin Steinsaltz

In the spring of 1974 I was approached by a member of an organization working for inter-faith unity with the idea of building a garden in Jerusalem which would serve as a quiet place where anyone was welcome to sit & rest. I didn't realize at that time there was almost no place in Jerusalem which did not belong to some sectarian group or another, access to which depends on many variables & vagaries & peacefulness or quiet not usually being an attribute of the particular sanctuary one seeks to enter due to guides, groups & guards all of which are busily going about their jobs guiding, grouping and guarding.

To me at the time, it seemed like a wonderful opportunity. The fact that war was imminent (always), that Israel was reputed by friends to be a police state, "of necessity," didn't bother me too much as from an early age in N.Y.C. I became aware that I already dwelt in a police state & if it wasn't a phantom F-4 that was the threat then it was the Young Saxons of 108th Street or some drunk punk looking to have it out in the bus station in L.A. or the parking lot of the Taos A&W Root Beer. . . what's the difference. The war is everywhere, in some places it's more out front, in others it's hidden, you have to drive the hiway between Reno & Las Vegas past the huge ordnance dumps that take up miles of the Nevada Desert or stumble on wierd fences up on the Parajito Plateau above Los Alamos to know what's really going on.

In any case the positive aspects of being able to work in the Holy City of Jerusalem on a project which I felt in some small way was an action that contributed to peacefulness outweighed any & all of the negative considerations & fears.

I had not done any work in a city for a long time as the various projects I have been involved in over the past 10 years have been in the mountains & high desert of New Mexico & in the Alps above timber line so I set myself to studying in a comprehensive manner the city, its languages, & the surroundings in which I would be working. I gave myself four months of study in the States & four more months of study in Jerusalem itself.

Now it is a snowy afternoon in January on the side of Flag Mountain in New Mexico & I have just returned from Jerusalem & I am in the process of concluding a sort of feasibility study of the project. In order to have an understanding of why Jerusalem is such a focal point, one must regard the whole situation from the perspective of the geography which has shaped its function.

Jerusalem is a crossroads, an axial point in the Levantine world between a north-south goods trade route & an east-west food trade route. Beyond this it is a gateway to Europe via the nearby sea, a gateway to the Fertile Crescent & the Orient & a passage between Asia & Africa. It is located on a plateau ringed on three sides by the Judean Hills & opening out on the fourth side to the East, the Dead Sea & the Judean Desert. The plateau Jerusalem occupies is the primary watershed in the Judean Hills with constant & regular springs, a key to survival in what is otherwise desert country.

The plateau itself is part of a system of mountains stretching from north to south dividing the Holy Land into two distinct eco-systems, the land to the west of the ridge system being

mediterranean & the land to the east, desert. The eastern boundaries defining both a topographical border (the plateau drops 2500 ft to sea level & then another 1286 ft to the Dead Sea in 14 miles) & a climatic border (two miles to the east & one crosses what is called the "starvation line," a line which denotes less than 400 cm of rainfall annually).

In addition the site is easily defendable in old term surface warfare concepts & able to withstand long sieges due to its regular water supply. In short if one were to seek an ideal place to build this would suit the purpose. Besides having these geographical/topographical advantages the site is possessed of an abundant & easily workable limestone locally known as *Mizi Holi* or "sweet stone" due to the ease with which it can be cut. This stone & its relatives, *Mizi Achmar* or *Mizi Yahudi*, are what everything is built of, wood being very rare & extremely expensive.

The hills & valley are covered mainly with vegetation planted by people for fruit & food: olive, date palm, carob, fig, pomegranate, & almond trees, & grape vines, with the tops of hills being given over to cypress, pine & live oak which form windbreaks & provide shelter from what is usually a blinding blue sky & blazing sun except in the brief winter months when the Mediterranean weather cycle brings in the rains & an occasional lite snow.

> I like very much when I wake in the morning & get up & looking at the East I see Jericho & the Dead Sea & the Jordan River, (I do not see them but I see like a shadow), & when I get up & look to the West I see the Mt. of Moriah, the Wailing Wall & most of the steps of Jesus — it gives a special feeling to one, you know, if he believes in God especially never mind about his religion but if he believes in God; and when you look at the South it makes you feel you are looking at these mountains & thinking of those who used to walk the mountains between Jerusalem & Bethlehem & Hebron; if you want, smell the olives coming from Samaria the mountains & Ramallah & those hills & you remember Jacob's story when he comes back & he built the first Temple so it's a religious country & it gives a special love for everyone born here or who lives here. . . .
>
> — *Ali, grocer on Mt. of Olives & waiter in Jerusalem*

From the high desert of northern New Mexico & from working in the tundra region above timber line in the Alps I felt quite at home in the relative spareness of the area. Some of my co-workers who came from such diverse places as northern Scotland & gentle Marin however were acutely affected by what they considered a desolate & stark region. It is, once you enter into it, an area of tremendous luminosity & clarity & an almost psychedelic intensity.

This briefly & with the aid of maps shown here outlines the setting of Jerusalem as a place in space. As for its place in time one must go back at least 4000 years in history & further in pre-history to its bronze age beginnings. As one comes forward to the present along the time lines one sees different powers or spheres of power controlling her destiny, different cultures holding sway & going under. People coming & going, Semites, Egyptians, Greeks, Romans, Byzantines, Arabs, Armenians, French, English, Turks, Russians, all building, fighting, dying, pilgrimaging, sacking, looting, raping, burning, caught in religious or political fervor of one kind or another. Prophets, generals, priests, kings, saviors & prostitutes, judges & hermits. A vast & kaleidoscopic spinning of archetypal images & mythic mystic happenings & what is so amazing is that all of that history has not vanished but is startlingly & vividly existent in the present. Nothing has gone anywhere, nothing has disappeared, everyone is here.

> He did perform the miracles, and healed the sick, but Jerusalem — he left — he wept over her. . . from the Mount of Olives, he wept over her. . . the people could not receive his face. . . but it is not simply the people of the time of Jesus. . . it is ourselves. . . people of the time of Jesus were the symbol for all humanity.
>
> — *Sister Dominique, nun out of habit*

Jesus is still weeping in Gethsemane. Abraham is sacrificing his son on the Temple Mount. The shepherds tend their flocks, the money changers are still active just inside the city gates, the Jews still dance & weep by the Western Wall & the Muslims still bend together at the call to prayer in the Haram al'Sharif.

In fact there is not a single time but three. For the Jew it is 5735, for the Christian 1975, and for the Muslim it is 1396. The daily English-speaking newspaper carries all three, each being considered the "correct" date according to the world one is living in. As one becomes more accustomed to the historical re-plays & vagaries that are a part of the everyday life here, one gradually acquires a sort of callous attitude to what are euphemistically called current events. The Israeli soldiers with their omnipresent uzi machine guns fade into Roman centurions, fade into fierce Franks, fade into Jebusites fleeing David's invasion.

> The guides tell you these crosses scratched on the walls are from the crusaders. Actually people come in here all the time and put them on. Come back in the daytime and bring a nail, that's the best way.
>
> — *Elias, Christian Arab*

Cinema posters in three languages on the street of the Old City just inside Damascus Gate

People walk the street in every kind of costume imaginable; the fox-hatted rebs from East European ghettos, robe-clad Bedouin from Gaza & Greek monks in 14th Century black caftans are passed by a speeding Time Square western businessman; Franciscans in brown cloaks sandal-shod wait for the lite to change next to a mustachioed merchant in a red Egyptian fez while Panamanian UN soldiers in blue berets whistle for a taxi & a woman with three goats leads them into the back of a VW transporter for the trip up to Nabulus & the olive wood worker from Bethlehem unloads his goods from atop the old Mercedes bus just arrived from the south in the terminal across from the Damascus Gate. Overhead a mirage or phantom blasts thru the sound barrier pulling up sharply to avoid the border just 14 miles away.

All of this & more is the setting in which I found myself in the autumn of 5734, 1974, or 1395 depending on which date you want to pick. A world far different than that portrayed in Time/Life, the National Geographic, the NY Times or on TV.

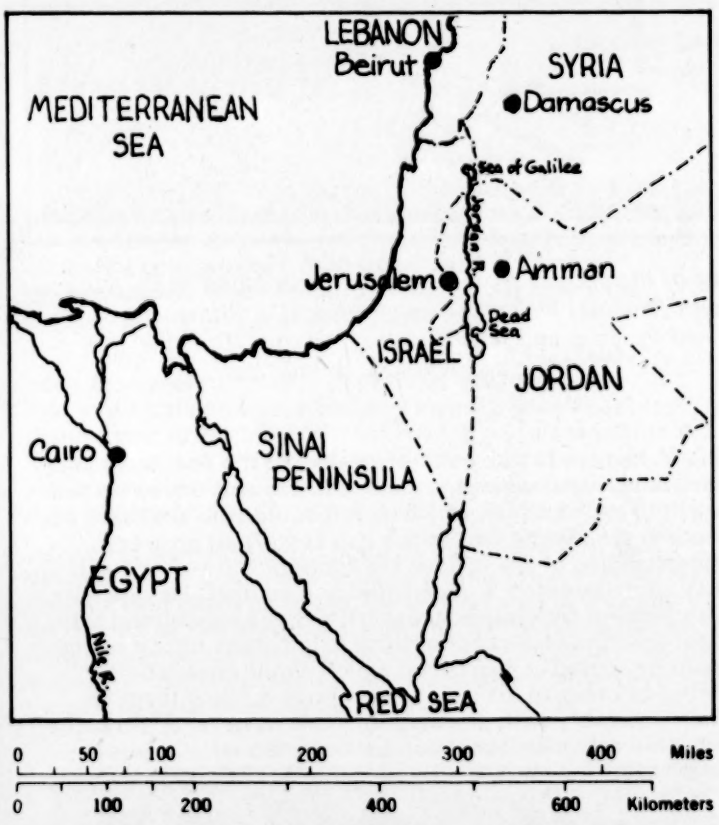
I had taken a ship, a freighter, out of Baltimore, as I wanted to take the time to prepare myself for what I knew would be another world. 15 days out on the ocean seemed like a good way to spend time as I had lots of time & besides it was cheaper than the summertime air fare. By the time I reached Haifa, to the north, I was empty of impressions & was looking forward to going deeply into this new world I was entering.

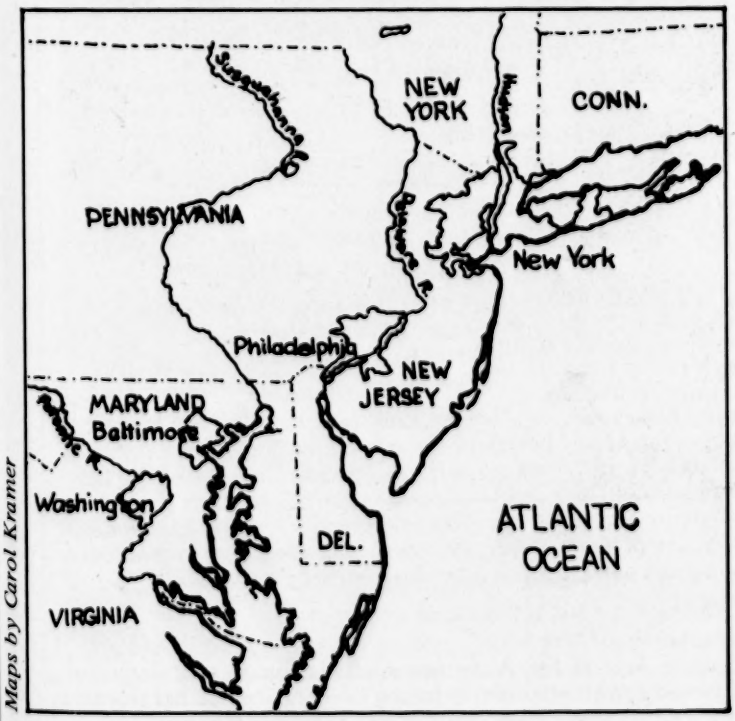
> Q: What is the name of the ocean?
> A: Ocean.
> Q: Does it have a name?
> A: Yes.

Q: On what sea is this ship sailing?
A: It is the sea near Jeddah.
Q: What is that sea?
A: This ship is not in one place. It is here & everywhere.
Q: Is Jerusalem a ship also in a way?
A: Yes. Jerusalem & the world is like a ship.

– Hadji Nur, the knife sharpener

A friend met me at the ship & one of the people I supposed I would be working with on the project accompanied us to Jerusalem. He had been here off & on since 1967 & ran a company in the States which sold & distributed herbs & was very deeply involved in various agricultural schemes as well as other schemes promoting peace in the Middle East thru the medium of technological & agricultural interfacing between Arabs & Jews. The trip from Haifa to Jerusalem thru Tel Aviv took a little over two hours. One quickly learns that the spaces between the capitals, indeed the interior spaces of the countries involved, are all in terms of hours either way.





Maps by Carol Kramer

To one accustomed to a three-hour 60 MPH car trip to get to the nearest big city in New Mexico, the scale seemed absurd, & one wondered how such a tiny country could arouse so much conflict on such a vast global scale, focussing so much of the planetary consciousness.

I can't be in harmony with a Jew who comes from Holland & blows up my house & takes my land & does all of these things to me & he asks harmony. He comes from over there to here, & he takes my house. How can I love him?

– Issa, Palestinian

I always thought that's crazy nationalistic-type thinking, fighting over land; it never was real until I got to Israel & I really felt that land to man is a really important thing — where a person lives & where he works it's a real thing it's his whole life it feeds him & he raises his children on it — it's a very profound feeling especially the way the Jews felt about Israel. . . Like even Ben Gurion when he had to go to the UN & he was asked what claim Israel had to the land he had to admit that our claim was that God gave it to us. That's our claim. Not because we work it but because He gave it to us.

– Wolf, student at Yeshiva

I was born here & my father was born here, my grandfather born here & my grand-grand-grandfather. I do not really know a date for my family in Jerusalem because it's part of Jerusalem.

– Ali, Palestinian grocer

We're only asking the Arabs to move as far as from one side of Chicago to another.

– an Israeli sociologist, originally from Brooklyn

The taxi took us to a small stone house on the Mount of Olives looking out to the Dead Sea & the Judean Desert. It was afternoon & the sun was hot & blinding & the house was a cool cave. Here we were to spend a couple of weeks getting acclimated & familiarizing ourselves with what would be our area of work. Later that nite we took our first tour of Jerusalem with a friend of the family, a young Christian Arab from Bethlehem who took us on a lightening trip thru the Old City, along the walls, into the Holy Sepulcher where they laid Jesus, past the Wailing Wall where the guard with his machine gun waved us thru the checkpoint with a perfunctory *"shalom,"* & back up the walls where we viewed the Temple Mount, the *Haram al' Sharif,* & the gold dome that covers the rock which is the lodestone & magnet around which the Old City revolves.

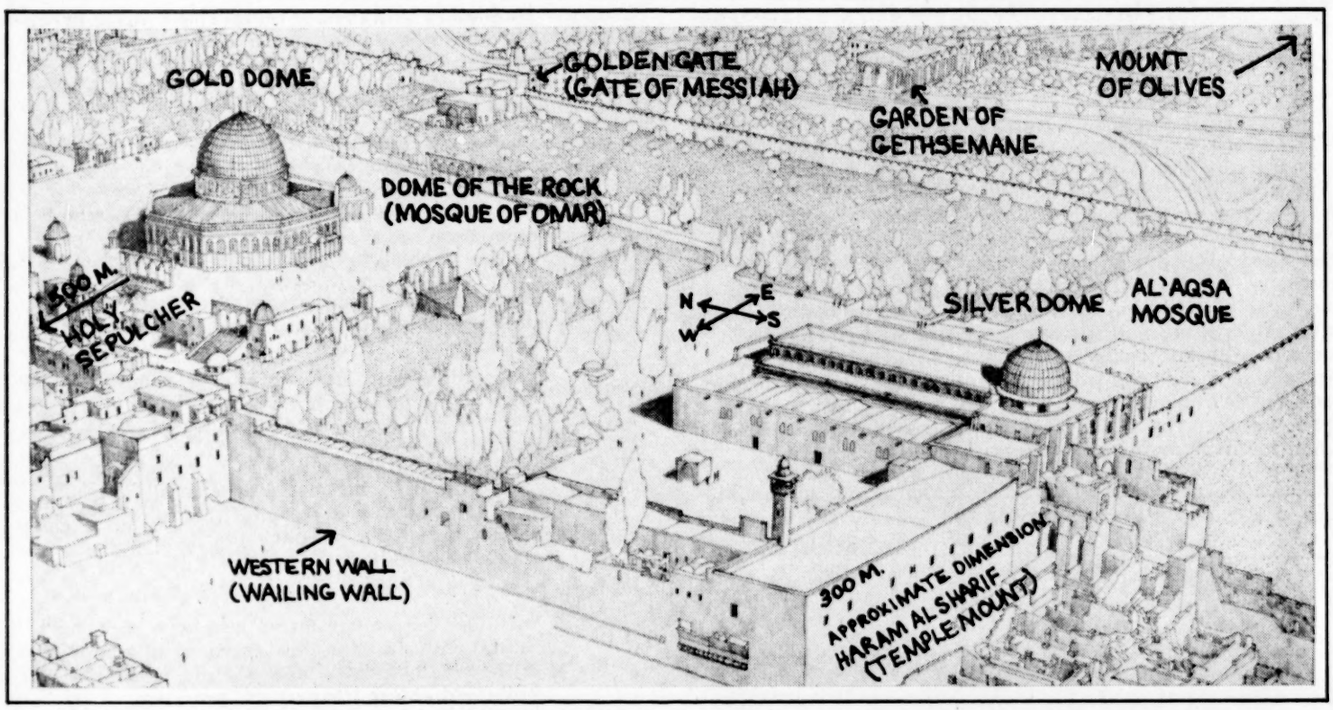
The rock where Abraham was to have sacrificed Isaac, all Jerusalem is this stone. . . which means in Hebrew, 'spreading out'; Jerusalem is spreading out holiness to the entire world. . . This is the place where the Shekinah or the presence of God dwells & spreads out to the whole world. . . It says in the Torah, "They should make for me a holy place — a Tabernacle, & I will dwell in them." It doesn't say, 'in it,' it says 'in them,' in the heart of each one.

– Jacov Tsadok Lider, teacher

The throne of God here on earth is Jerusalem the city & also the heart of the lover of God. The heart is the mystical thing & the city is the outside thing.

– Siddi Sheikh Mohammad, Muslim judge

At this point it is necessary to give a brief history of the project itself. In San Francisco in the late 60's a man known variously as Sam Lewis, Murshid S.A.M. or Sufi Sam emerged to inspire many people with a unique vision of the possibilities contained in what he termed, along with others both in the East & West, the New Age. Part of his message was that a new age could be arrived at by bringing people of various beliefs & traditions together to sing, to dance, to work, to pray & to share food with one another. His work was a continuation of the ideals put forth by those he considered his masters & teachers, including Pir-O-Murshid Inayat Khan (the master musician who came from India to give the West a message of



The Haram al' Sharif (Temple Mount) from the air. On the site of the present Mosque of Omar have stood the Temple of Solomon, the Temple of Herod (of which the Western (Wailing) Wall is the only remains), a Roman temple and a Christian church. Sited on an east-west axis defined by rising and setting equinoctal sun. [Drawing borrowed with gratitude from an excellent book, **The New Jerusalem** *(Planning and Politics), Arthur Kutcher, 1973, Thames and Hudson Ltd., London.]*

spiritual unity), Papa Ramdas (a South Indian master who taught that work without devotion & love was useless work), & the first Zen master in the US, Nyogen Senzaki (who worked for 20 years alternately as a dishwasher & "house-boy" the better to understand the dharma in America & the West). Indeed Sam himself for years was a gardener & groundskeeper in Golden Gate Park. I remember once visiting him on Precita Ave. in S.F. & stepping into the back yard of his simple row house & seeing one of the finest & most productive vegetable gardens, all growing in a space usually covered with cement or trash thrown out of windows. I also remember him during one of his summer visits to the Lama Foundation out in the garden in the early morning applying fish emulsion, which he kept in bottles underneath his bed, to the roots of the plants. In short, he was an ecologist before they called it that, maintaining highly technical correspondence with Luther Burbank & George Washington Carver.

> Before they used to be stronger, because now they do not work. People are too much tired, worrying and thinking, but before, no. Just a loaf of bread & a little olive oil & a little olives & this is their food, but now. . . before we used to raise tomatoes & squash & other vegetables, & we left them to grow. But now they are putting water & taking care of the vegetables, so the vegetables do not have that . . . power. . . they are not like before. Because before we used to plant in an old way that the vegetables come more rich, thats why it took three or four months in the earth. But now when they are taking care, they want it so quickly in a month, like the vegetables or the cows, so it is nothing. Before the food was much better because it took time to plant & to raise. But now everything so quickly. . . take the chicken: before we did not used to eat the chicken less than six months or one year, but now we eat chickens forty days. Before we used to raise cows, we milked by our hands & we used to boil it & make cheese & butter, but now its everything machines machines machines you know which is not so nice. Before it was healthy.
>
> — *Mehiba, Palestinian grandmother*

S.A.M. had spent many years traveling in the East & Middle East, studying at various centers, & during his travels he had begun to evolve a plan which he felt could help the cause of peace in the Middle East which had as its basis an overall understanding of the various life zones or eco-systems & how they complemented & augmented one another. He saw how, with Western technological expertise & the agricultural skills & survival knowhow of the native Palestinians, that a merger could be arrived at & affected which would enable both parties to improve their living situations & allow them to dwell peaceably with one another. This however could come only thru active collaboration between the various groups concerned.

> The Muslims have a saying: eat from the food of the Jewish, & sleep in the house of the Christians, & pray in the way of the Muslim.
>
> — *Fatima, age 70.*
>
> It's possible anywhere, but this place is prepared, like plowed land.
>
> — *Jacov Lider*
>
> The city itself has been destroyed 14 times, rebuilt, destroyed, over thousands of years.
>
> — *Yissachar, student*
>
> It's like compost.
>
> — *Sadiq, interviewer*

Back in the late 30's he was already imagining de-salination stations, or the use of oil drilling technology to tap aquifiers in the desert regions, or even elaboration of Hopi & Pima dry farming methods to begin desert reclamation. Tho S.A.M. died before *Dune* appeared I imagine that it would have been a favorite of his. I know from reports that he kept very close track of the various schemes of desert reclamation in the arid areas of Southern California, which he viewed as an analogue to the general overall area known variously as Israel or Palestine.

Unfortunately events have not favored such a collaboration between Arab & Jew & instead we have the present situation of armed camps adamantly facing one another across borders which while they could unite them, divide them.

In the beginning of my life, the Jewish & the Arabs were like brothers. But the little troubles which have happened for so many years have changed this, but I hope that God will help & be that love between them again. Inshallah, Inshallah. They will be together, together. Inshallah. Jews, Arabs, God sent them. They are coming from God, both of them are brothers. They must love each other. I don't know why it is so hard!

– Mehiba, grandmother

Everyone according to his role must help his fellowman. If the people of Israel are the people upon whom the Kadosh Baruch Hoo (the holy one who is praised) placed the study of Torah & the fulfillment of Mitzvot (commandments), then all the nations of the world are obligated to help them to arrive at this. And at all times, not to hinder them from this — and not to lead them astray from this — only to allow them to go on their way to fulfill their task, & to bring the world to its fixing.

– Rabbi Gedaliah

The only difference between people is who is closer to God. We are not the chosen nation.

– Assad, Palestinian co-owner of tea shop

However because it has not yet happened there is no real reason to believe it couldn't happen. In fact it is happening but in a limited & for the most part veiled way. Veiled in the sense that collaboration & co-operation aren't news & don't sell newspapers & so one doesn't hear about where the vegetables that feed Jerusalem come from.

In any case, I had gotten to know Sam & of his plans first at Lama & later thru some of his friends & became convinced that small-scale non-governmental projects were possible & that maybe, or *Inshallah* as Muslims say, such a small project, tho it would not attract much attention, could serve in some way to begin to create links between people if gone at in the right fashion.

Jerusalem, being the pivot point in the Middle East, was decided upon as the place to begin a pilot project. Here, if a piece of land could be found, we would begin to create a microcosm of the region & create a garden in which all the flora indigenous to the land could be grown together. At the same time the garden would be a place where passersby could come in & sit & allow tension to melt for awhile.

Afternoon in the garden of the Winemaker

Of course I think peace is possible. You know when I was fighting in the last war I do not think the men I was fighting wanted to kill me only what I was, I did not want to kill any of these men either only what they were representing.

– Amos, guard for Israeli Civil Arms Authority

I teach in an elementary school. A child when he's eight years old, you ask him, what do you feel about the Jewish people? "I don't like them, I hate them!" Imagine, eight years old. Because you know there is a big tension at home because the parents are always thinking about war, what they feel from the atmosphere outside. The child has no opportunity to give his opinion about what he is feeling, he's feeling with his parents. It's true.

– Issa, Palestinian schoolteacher

The Jews suffer a lot, Christians suffer a lot, the Muslims suffer a lot. . . the educated people, I mean the groovy people from them they should leave all the governments of the whole world & all the leaders of religion of the whole world & they should connect through this suffering, relate to each other, because they suffer the same. . . I mean not give energy, instead of giving energy to them I give energy to you & to him & we sit together & we build this by our hands — this state. Also stop listening to the fake teachers: the Arab teachers they teach the kids that the Israelis are not good, they will kill you & the same thing the Israeli teachers teach their young people: the Arab people, they will kill you & throw you in the ocean & all of this stuff. None of this is true & those people should be stopped by both sides.

– Anonymous young Palestinian

Further we envisioned that the garden, not being merely an ornamental one, would provide food for a house which could serve as a center open to all which would further fulfil the larger plan to bring people together to eat, to sing, to dance & to pray – 'My house shall be called a house of prayer for all nations' – thus creating a small area of peace in a troubled land. By not preaching but feeding we felt that the example of such a garden of peace might well spread beyond our small beginning & serve as a model for future possible means of rapprochement & collaboration.

The problem is not such a big problem: make the young generation understand that this country is a land of love, not violence; one could easily grow things there. There is so much barren land, & one could have two or three crops a year. Much better than to see things burned & destroyed.

If you treat yourself well, if you seek yourself, if you try to be peaceful with yourself, you are there just as one seed, but then it grows & there will be another one next to it, & another one & so on, & you'll get a whole community, a truthful community. That's one but slowly there'll come more & you build a peaceful truthful country, a country that really wants to live. Here in Israel I'm awfully sorry, but many people are existing not living.

– Arab rug dealer in Old City

This then is what had brought me to the Holy Land & later was to bring others to the house on the Mount of Olives.

Obviously such a plan cannot move from the idealized abstract level to the level where it is actualized without the participation & active collaboration of all concerned. I have lived the better part of the last ten years in "community," & have only little by little become aware of the subtle & delicate balancing which is necessary to make a project "go." A community is in a sense an organism, & the first & most basic requirement in any communal undertaking is the tuning process, watching the breath of the whole body.

People is people; people is people. All of them is one man exactly. Just God & the praying is the way. . . the praying is the way. He just make one, & then there are people after that. . . Adam, & from Adam, you have a lot of people. . . so all these people are one, & they must pray to one God.

– Fatima

I find peace here because peace, for me. does not arise from a pacific social relation, but from within . . . social relations, like the weather, are constantly in flux — but the unity, the reality is one — it doesn't change. One searches, in the exterior, the fruit of the interior. . . one can try to impose peace externally — industrially. through arms etc. But the real peace is a river which flourishes as it will; it is the fruit of the heart; it is not an industrial product; one cannot fabricate it.

– Paco, a Spanish monk on pilgrimage

There were & are difficulties which we faced in implementing this plan. The initial & most overwhelming one centered around paranoia & neurotic speed, both singularly & in the community.

The people we had come to live with had the highest of ideals but little real experience in communal living. This was to prove our initial failure & was to consume valuable time while we tinkered with the instrument & watched our energy trickle away. Finally after a few strange strained weeks there remained a group of 13 of us of various nationalities & practical skills who had agreed to come together in Jerusalem to work together & be together. From the first we became aware that, while to the world such a project seems small & inconsequential, the logistics were staggering. Thru the generosity of a friend in the USA who had cashed in $5K worth of Carnation Milk stock we had enough coin to be able to get our ship together.

Remember the story of Zacharia when he goes to Miryam (Mary) & asks her: "From where do you have the food? Who brought it?" And she explained to him that in the mosque they dance & they have light, so from where do they have it? "Explain that to me," said Miryam, "& I'll explain to you from where I have the food."

– Murshid Hassan of Nabulus

We found a house on the southern tip of the Mount of Olives which was large enough to house us all adequately if somewhat spartanly, & prepared to move in. What I can't tell you is exactly how very traditional this little village is, but if you can imagine an American Indian pueblo or a rural Spanish-American village you get a bit of the picture that we were faced with. Tho it was all "OK," it demanded of us the utmost in politeness & sensitivity not to offend our neighbors. This translates into the way one dresses, how much of what goes on in the inside can spill out, the manner of addressing people on the street, the whole question of life style, the attitude of the East (this is an Arab village) toward women & a host of related problems. Also you must imagine that Israel was at this time on standby alert with all reserves called up & war games going on daily & nightly right out our windows which looked out on the border a scant 13 kms. away. What this means is that just as you're about to fall asleep there is this huge blinding flash accompanied by the entire (stone) house quivering, the windows rattling but it's only jets dropping flares for nitetime maneuvers or the endless crump of mortar practice punctuated by the dit, dit, dit of automatic weapons. None of this stops or starts or rather it stops & starts & stops & starts & there is this continual sense that at any moment the whole trip can go out from under you. I remember one day hanging wash on the line when I heard this roar which was like the end of the world. I hit the roof & looked up as four phantoms cleared the nearby trees over the monastery so close I could see the rivets in the fuselage as they passed over. (Like I said it's "OK" but after a while it can get to you. & when it begins to get to you then you really understand what meditation & tuning is all about & what for.)

View from the house of nighttime "war exercises" in the Judean Desert 13 kilometers away

If I walk the street, I feel that holy thing coming over me. The people, when they talk. The works come with love, with friendliness. Each time, each year, this feeling is leaving more & more. My heart still feels the same towards Jerusalem, but I don't feel the same from the people, what I used to feel from them before. They still love Jerusalem but the love is dead. They know the work of love but they don't know the meaning of love. I think the reason is the pressure in which the people live. . . the war, for instance, the hate — when people live in war, they feel, everybody hates them, everybody will fight them. That has destroyed the love in some people. But some people, they make more of it & stronger.

– Aziz, enjineering student from Jerusalem

I see tension in all of you today from events in the area. Who cannot accept both good & bad from God is not in the circle. . . The whole situation going on in the country is like a woman in labor. As you can't stop the labor or do anything to a woman in labor, so here you can't do something. Regarding the young man who leapt into the street during the police actions to help the girls who were being beaten; the mercy in his heart moved him to do it, it was right & good for him, but he can't stop the will of God, just as it was right for you with your strained back to stand & watch. The wisdom is to be what you are.

– Siddi Sheikh Mohammad

So in the midst of this kind of daily nerve war with the guns & planes & soldiers & commando raids we have the whole scene of melting into the neighborhood, which was both a pleasure, an honor, & a necessity. Getting friendly with the kids means a lot of stops on the way up the hill and also means they learn not to stone (literally) the ladies; playing soccer with the local teenagers is not only good exercise but means we can be reasonably sure to get home at nite; spending time with immediate neighbors over the back wall, watering the cabbages in the garden of an evening with the landlord, attending a wake with the local patriarchs, all were steps into the possibility of feeling comfortable in this new home. All of that & trying to get the instrument in tone with itself, buying an icebox, finding where to get butagaz to run the stove, making contact with the local wholesale grocer for the veggies, finding the street where whole grains can be

purchased in bulk (of course everyone is hoarding & inflation is eating us all alive & eating some of our less fortunate neighbors more), going to Bethlehem to score mattresses (you save 35 - 30%) & trying to get them home on the bus in the meantime endlessly crossing borders where on one side you say *shalom*, on the other you say *salaam*, & you have no idea at any time what is the fair, true & honest price. First lessons in relativity.

> . . . a human being is a word that comes from "oman" & that means "live together."
>
> – *Ivrahim, owner of Mt. of Olives Bus Co.*

In the meantime we needed a plausible front to go out & make contact & find where it was that the garden might be.

Mostly all of the 13 of us who remained had not only worked together in building & construction & maintenance of life-support systems for others, but individually most of us were also artisti & writers, poets & singers, carpenters & cooks. In addition we had all worked together before producing books, so that seemed to be the direction to move in once again. Our publisher in NY also seemed open to this possibility. It was obvious that the amount of money needed to create such a garden was far more than we had together. If a book could be produced we could use the returns to buy the land, to build the garden.

What the format of the book would be was interviews & photos. Surely this would be something people would be interested in & at the same time we figured that a publisher would see the commercial possibilities & the whole thing would jell in a good way & we would be able to manifest the garden at a later day & at the same time we would have a perfect cover to go out & talk with many different people the better to know where it was that the whole thing was at. Not only that, but also at the same time we could start inviting people home where they would meet other people who had been invited & in such a way we could begin to make the contacts which would result in a network being formed. Such a network, formed of non-paranoid individuals, (assuming that people who make contact across lines that they didn't "have" to cross were open to other alternatives hence nominally "non-paranoid"). We would have a chance to understand what was really going on in Jerusalem from the people who really lived there.

> When I was a child I had it much more in me than now. I wish I could believe in it. I remember when I was a child reading a story in a newspaper about King Hussein dancing with an Israeli girl & that was such a feeling of a possibility of coming together. . . I wish I could believe more in it.
>
> – *Offra*

> One thing about Jerusalem, everyone puts each other in a box or a form — who are you, what are you, who do you belong to, what form are you this — so that they can place you into something. & when you really believe in one God & that's your belief & He's really the teacher, altho you might be studying at one of His millions of institutions to get some breath, it's hard because people want to put other people in a group, in a family situation, because the family has been dispersed so long that it's hard to think of it as one. . . the vessel was broken & we were scattered around the world just as, say, on one level the Hebrew people were scattered, & on another level all nations were scattered.
>
> – *Moishe Shure, student/teacher at Yeshiva*

To this end we devoted our group energy. We knew we couldn't really stay long enough to get the garden going, producing & functioning in tandem with the open house plus we knew we couldn't "afford" it. So we decided to run the open house & follow that part of the plan which consisted of feeding people (on many levels) & singing together & praying together & working together. Many of those who came stayed to help us with translation, introductions & even the actual interviewing.

So many times looking around our dinner table (which was rugs on the floor) & seeing the Arab talking to the Jew who was passing the *kemadji* that the lady from Holland had baked, & the Jordanian hippy rapping it down to the rabbi & his friend from Santa Barbara, I knew that this was a simple answer, & it was not some huge peace plan with so many clauses about who goes where & how many & when, why & wherefore but rather than a peace plan it was peaceable living.

> He is the God of all. He doesn't want to cut anyone out. He listens to the child & the sheikh the same way. The man & the woman he listens the same way. Just the person must have his heart in real. The heart must be completed.
>
> – *Siddi Sheikh Mohammad*

The only flaw was ours. We were buying food. That is that the energy to maintain the manifestation was not internally generated but we were still dependent on an external energy source to allow the peace to be. It was less than the $14 million that the phantom cost (also thought of as a maintainer or provider of peace by some). It probably also cost less than one of those parachute flares that cast their nacreous magnesium glow on the still desert below. But it still cost something & that something was ours only thru grace & only for a certain period. What to do?

We continued to do interviews & photographs daily, as well as maintaining the "open house." Two members were gathering all the Biblical (Torah & New Testament) mentions of Jerusalem & two other members were culling the Koran & the Hadith (sayings of the Prophet Mohammad P.B.U.H.) for all the Islamic references to Jerusalem. What we had begun to see was a book with enough margin space that all pertinent references made in & thru the interviews could be tracked in the margins & we could show exactly how the time lines intersected for what we began to perceive thru the interviews was that basically everybody, Muslim, Christian, Jew & nationalist & communist was saying essentially the same thing or wanted the same thing thru maybe different routes, & that everything that they said concerning Jerusalem & the situation in the Holy Land had already been said or written in their various scriptures. The dimension of time collapsed upon itself leaving only the eternal present.

> There are some ignorant people who visualize God as an old woman who had a certain number of kids & then rested. But the belief of the believers is God is still creating, not resting, & every movement, every calmness is God's creation, in every movement 70,000 pictures. . .
>
> – *Sheikh Hassan*

We further felt that if thru the medium of the book, the reader could be led thru to that understanding it might become possible, if enough people read it, to reveal thru a small crack the dimensions of which Jerusalem & what occurs there are truly composed, & thru increasing understanding to diminish (hopefully) some of the tension focused on the area. But in order to do this we had to give the information to people in their own language. From this need was born the idea of publishing in three languages, tho ideally we should have four: English, Arabic, Hebrew & Russian, as these are language groups who have a vital need to understand what is occurring in Jerusalem. The reasons for including Hebrew & Arabic are obvious. English & Russian are not more difficult to understand if you ask, 'Where do the weapons to continue these wars come from?' All the groups need to understand the situation together; if any one side has understanding, it can only be partial as it is an interlocking situation which involves all the parties.

The "bias" or viewpoint we had come to after many interviews was that people basically all wished for the same thing: an opportunity to live their lives free from constant fear of oppression & in harmony with their neighbors. As our Palestinian landlord said, "Look, I've got nine children. That's enough trouble right there. Do you think I want more?"

> When there is peace in my country I will look towards the world. . . war is something we hate, we like to live in peace with everybody & we like

to improve our life & our knowledge & to guarantee that our children will have a good life, happiness & friendship.

– Mr. Asfur, Palestinian businessman

All around the world, I see everything is upside down. Many brothers, many sisters come over here, we talk together. Few people. Too many people we can see but few people who know. In every country there are two, three, four persons. Really. This is what I know well. But you can say many churches, every country has churches and churches. We can say for example you might be a plane in a day in a journey to Istanbul. to Turkey. You can see how many mosques there are in that area. Thousands & thousands of mosques. If we want to get five persons for each mosque, it will be full. No need for that. No need for all those buildings. The thing that people are in need of is the peace. All around the world, wherever they are. . . It is the mistake of the wise men, who belong to the governments, which are making manufacturers and making arms & they are selling & the price will go up. It is the blood of you & me & the others. That money is blood only, not more than that. The price that goes up is the blood of the people. They want to make a new model of arms, for example, or planes. They want to try it. Where? In the mountains? No, they want to try it on people.

– guardian of the tombs of the prophets above the Jewish cemetery overlooking the Old City for 27 years

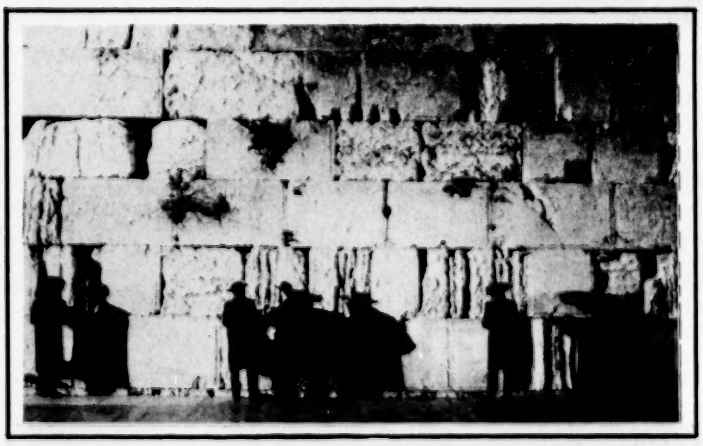
Tho this all was the general attitude of the people, in differentiation from the governments involved, we also found thru the interviews that there were areas of stereotyped misconceptions of each other on the part of many or most. A lot of these misconceptions, such as the popular knowledge on both sides that the other had horns & a tail, had been broken down since 1967, by the fact that thru the opening of the borders there had been a greater interchange, as people began moving back & forth. However, others had grown up, because of tension, mistrust, & cultural conflict. Some could see the complexity of the situation, others couldn't.

The problem is, the world propaganda is that the Arab world wants to push the Israelis into the sea. What if you look at it the other way round: that the Israelis want to throw us into the desert? That's what's happening, that is the whole basic point. If they want to live in peace, they can do it. . . But to have Israel exist, you also have to put the seed in their minds that they are here to stay, not that they're gonna be thrown out.

– an Old City shopkeeper

They've got 22 countries to go to, and we have only one. This one. We've been refugees for 2000 years and the world didn't make much fuss about it.

– a New York City furniture dealer



Jews at the Western (Wailing) Wall

The man a few doors down worked construction in Tel Aviv commuting each day back & forth between the worlds. What is it that these worlds are? A Tale of Two Cities: The ancient walled city that is always the end of some road & always the beginning of another where the road crosses, the destiny of a journey, everything in it contained & containing everything in it. The rising & falling streets, the three cornered maze each ringing round to its holy spot, the holy place, the source, be that source only a reminder as the Western Wall, the wall of tears, the Wailing Wall where all the stones are the colors of flesh, & all the flesh is covered in black endlessly dovening head against wall, temple against temple, & if you had turned some other way, entered thru some other gate, coming down from Gethsemane across the Valley of Kidron in thru the Lions' Gate, the Gate of Stephen, up the Via Dolorosa, the Street of Sorrow, in the footsteps of Jesus, now as then thru the market place each selling something, each door with its figure inviting you in *fadel,* please you are welcome, come in, sit down. . . & against that days of terror revolving around negotiations to extend the fragile truce in the north when no one will look at you & shops are opening & closing in tune to the rhythms of soldiers in armed patrols. As one shopkeeper said to us, "What can I do? The Israelis will arrest me if I close, the PLO will kill me if I stay open."

You can see, people going round buying & selling, all around the markets, shops & so on, but something, if you can look well, you can touch it: they are not so freely, not complete happiness they have. Because, for example, a big noise starts to be. Everyone is running away, flies away & says: "War starts!" Everybody is waiting for this. No safety to move or to go somewhere. Why? Because: hate in the hearts. People against others for nothing.

– Tomb Guardian

Street scene in the Old City

The city of emotions blown by winds of tension one day open, sunny, inviting, one day you can cut the blackness & oppression, palpable, violent, & jagged. Everything is on display on the Via Dolorosa, nothing held back except everything hidden behind doors designed to be closed & bolted immediately, blind facades, a stone alley crowded at one moment empty the next, the street that ends where they lay the broken body of Jesus, a piece of stone, more stone, the city of stone, everything marked by a stone, everything enclosed in stone. Echos & the mumbling of the crowd, the clicking of donkey hooves running a load somewhere, the clicking of the prayer beads in the hands of dozens of men,

taking the morning sun having coffee short & strong, in front of the cafe on wicker stools surrounded in clouds of blue smoke. City upon city where three levels up the pink geranium blooms against the blue sky, & one level down Ali drops the water jug thru the floor of the store to the pool below, the water sweet & cool as it is in the fountain of the *Haram al' Sharif* where you would be if you had turned off the street of sorrows past Saint Mary's Baths (cleanest baths in the Middle East) & gone south or perhaps come straight thru *Bab-i-Shams* (Gate of Damascus) & thru the huge green gate manned by two guards, one who checks your papers, the other who checks your heart, or perhaps up the ramp by the wall & in thru the small green gate.

The *Haram al' Sharif* The Noble Sanctuary

The Temple Mount

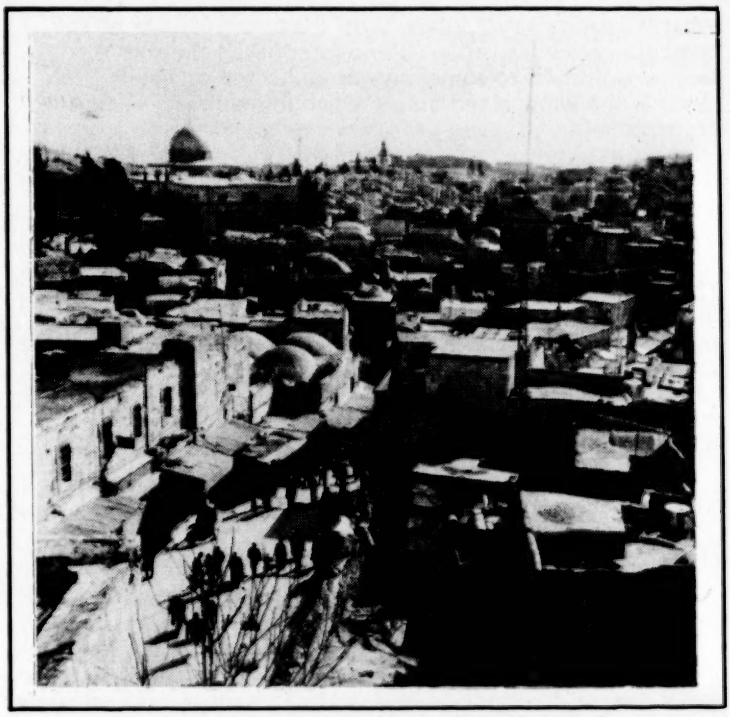
Here in the center all the noise & echoings of the city fade. Here in the enclosure within the enclosure is the city within the city. The heavenly city within the earthly city. Where all the forces come together. Sun Moon Axis & the gate to the east where the equinoctal sun shines thru as it rises over the Mount of Olives all lined up in a cross. The Golden Gate of Compassion & Mercy, the gate thru which the Messiah *Messeah Ma'adi* comes. When we asked them why they didn't open it they said, "impossible."

> I believe that the Celestial Jerusalem has already commenced. . . we cannot rest tranquil, dying we will enter into the celestial Jerusalem. . . one does not enter alone into Jerusalem, but with all one's brothers & sisters, one does not enter alone into the presence of God, but with countless beings.
>
> – *Sister Dominique*

& this whole incredible connection of past & present, this city adrift in time eternally marked by the imprint of wandering all enclosed within its walls & without: The Other City. I really can't remember its name because they all seem the same. Just like the Howard Johnson's off the thruway or the Union Station or was it Dallas or Miami International Airport. Scab city. The same madness, the same insane frenzy, civilization with no heart at its center just the cancerous mouth consuming another hillside. Everywhere the beat goes on, ear pressed to transistor decoder the electronic voice of the beast crooning the same song in every ear of how you don't have enuf but if you get whatever it is I am pushing you will have enuf or if it runs out breaks down or is designed to self-destruct immediately, well, friend, you can throw it away & get another nylon acrylic flame throwing F-4 phantom mirage cadillac washmachine-combination dryer. & everything looks just like that like it's just about to fall apart, rust, snap, become unbolted & disintegrate before your eyes like the plastic laminated imitation teak seats in the new bus. The 20th century magic of how nothing is something but if you look twice it's liable to blip out or be trash mashed into an alternate existence. The New Jerusalem is not what Wm. Blake had in mind. But there it is: the fortress ringing the heart.

> You see, the Israeli came to Jerusalem & they have their culture, the European culture & the American culture. But you see what our people are taking, they are not taking the soul of the culture, what's in; say they are taking an apple, they are not looking inside at what they have, they are taking only the skin, which is terrible. They are imitating. Now many Israelis are imitating the American because they are strong, they have the power & everything. Even the way they dress you see. And now the Arabs, especially the young generation are imitating this, in a vulgar way, you can say, not to mention their own faults also.
>
> – *Issa*

For readers of such a quarterly as this it is not necessary to recite the familiar litany we know so well, the hi-rise ticky-tacky imitation bubble gum blues. They're singing them in Jerusalem as surely as in L.A. But what is happening here is that there is something to view them against. Here there is always the Old City providing the point of reference. And old is only one way of looking at it.



Rooftops and streets of the Old City with the Dome of the Rock in the distance

I remember outside of Dehradun in India watching maybe two dozen potters making small clay cups which were then used to sell tea "to go" in. After having passed thru the fire the cups became sterile so each was clean for the user who, upon finishing his tea, threw the cup away whereupon it was ground into the ground by passersby & I could easily imagine became a cup again somewhere up the time line.

> The people living on the throne of God here, aside from religion, their bodies are from the earth of the buried prophets. All the earth here is holy because prophets are all mixed up in it, & people born here have bodies of this earth. Also one living here & eating the food of here gets that transmission.
>
> – *Siddi Sheikh Mohammad*

Perhaps the strongest ray of hope I feel & felt there was the nearby desert & its inexorable tenacity & unremitting logic. It's a difficult place to really impose heavily on. The feed lines are ephemeral & subject to the same vicissitudes which have created the desert originally.

The problem on the plastic path is that you can really get to thinking it's natural to live on the 21st floor surrounded by a concrete desert where there isn't a vegetable garden in 20 miles. I remember one man saying, "Look, when & if the oil goes, who do you think is closer to the earth, you (meaning American) or us (meaning Arab 30 years away from nomad existence)?

Sometimes I'd walk to Hebrew University & watch the kids coming & going, doing an interview or two. Not knowing again if it was M.I.T. or U.S.C. tho more Californian (palm trees & smog), & watching them I knew that they were learning next to nothing about what was really happening during this hinge period we're in, & that the world they were inhabiting had ended years ago & that this one is just the prolongation of the death rattle.

> . . . the light was given several thousand years ago & people have built many fences around it to protect it. Many people have decided to spend their lives mending the fences. And then those came after those who mended the fences to mend the fences of those who mended the first fences & I guess they meant well, & people do mean well.
>
> – *Moishe Shure*

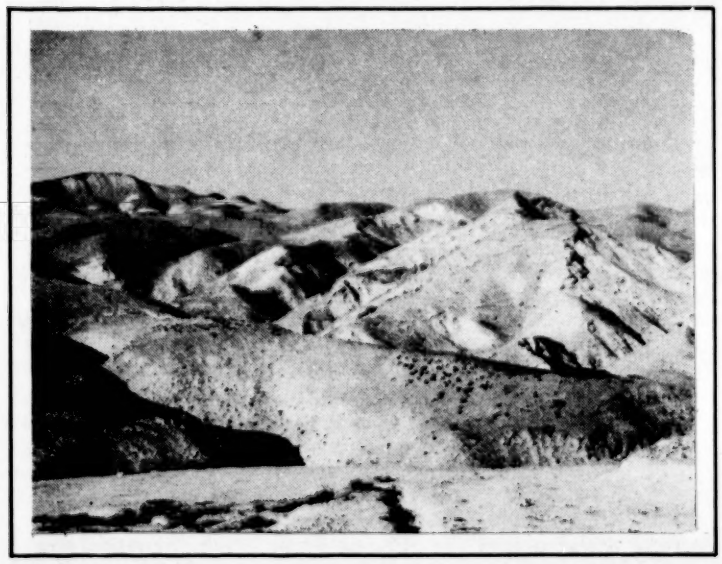
Sitting in the library looking at all the bent heads knowing it will most likely go on (where do you think all those petro-dollars will go?), a pattern somehow every "emerging" (into

what?) country must follow until the consequences of the transition are observable, all one interlinked chain of a collective aspiration to somehow get up on top of the shifting sands & the windcarved dunes which immediately slide & crumble.

> Now, the heart has changed. The heart of the human being. The world did not change, but the heart changed. This is from God.
>
> — *Hadji Nur*

The desert & perhaps the war, tho it, like the bent heads & the Chevy Stingray on the beach outside of Tel Aviv is only another gasp & gurgle, are the real as contrasted to the unreal.

> I tell you something what I think about the prayer the religion. . . during the war you see I was wounded during the war & it was in the night & I had to stay in the same place for the whole night I didn't pray I didn't ask the GOD for help I just think if I see the sun in morning if I see the green, my parents & family it will be enough for me all my life. . . I don't think about the university or money or the job just to continue to live so you can say it's a prayer or something. . . in my heart.
>
> — *Amos*



Desert landscape outside of Jerusalem

In the desert as in the war the boundaries are very clear. Something like one false move, a bad "mistake" & you've had it. These kinds of parameters seem to invoke a different kind of awareness & response in people. Also their survival depends on awareness not to something in one's "head" but right now, right in front (behind, left, right, above), this moment here now awareness.

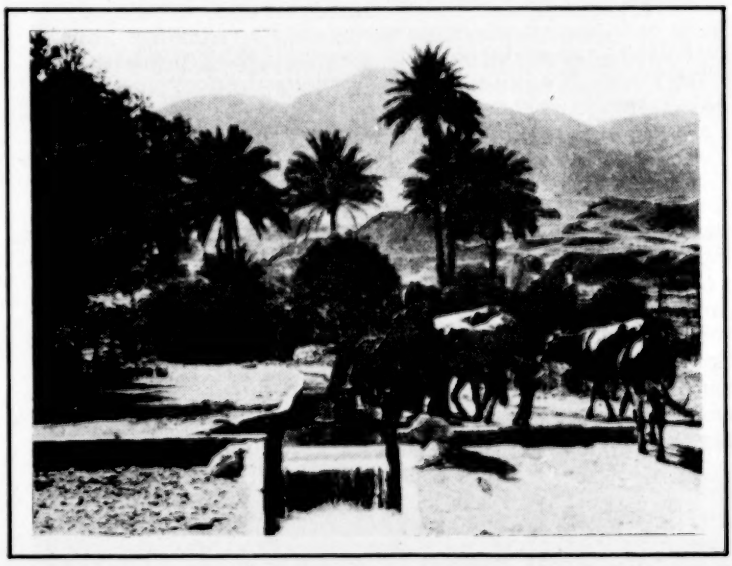
After awhile I had forgotten why I had come to this place. I seldom spent any time going to the cities, either of them. They oppressed me with their walls old & new. I had no interest in creating another "anything" in this land already too filled with things. We found wonderful gardens with both flowers fruits & vegetables where people made us the companions welcome. The book faded in & out as I realized no one could ever understand anything even if it was in ten languages. Something else was called for than another "peace plan" in this land abounding in peace plans.

> I pray for all the lovers of truth without difference between them of who they are where they come from what language they talk, because their language is the language of the heart which knows no border or different kinds of people or different languages.
>
> — *Siddi Sheikh Mohammad*

So instead of taking the bus over to the west & to the city & the market & the Mercedes cabs & the big Egged buses & the spiritual Disneyland, noise confusion twisting streets & yelling shopkeepers, money changers, priests, nuns, rabbis, sheikhs, highpriests & armed guards & camera-armed tourists, I took the bus to the east, to Jericho, to the Dead Sea, to the desert.

> The principle of wisdom is to stop. . . to stop. . . & begin to see & to be seen. . . to listen & to be heard. . . one must withdraw attention from the appearance of multiplicity without, to find the source of unity within. Also, this peace is a gift — a gratuitous gift; one must rest receptive; one cannot construct or fabricate peace: it is not a question of action — but of being.
>
> — *Paco*

Somehow in the desert everything clears itself. I could see Jerusalem as I could see all the cities, rising & falling on the waves of time. In Jericho, by the shores of the Dead Sea, inhabited for 9000 years, fed by the springs of Elijah & graced by groves of slender date palms, it was evident what scale the whole place was on. Layer upon layer, level upon level, the grand canyon of human existence. Looking down into a dig where the cultivators had stored their grain in a tower whose top was 40 ft below where I was standing looking into the hole at the top of the tower 40 ft down & 9000 years ago. & turning away looking over the plain, the golden city of mud, the whitewashed houses the living sepulchers,



Irrigation ditch on the outskirts of Jericho

the monotony of the heat, the emptiness, the roofs as they fade into the desert gold upon gold, house out of earth, & the groves of palms, the hidden springs, the sustaining water of life, the telltale green, all revealing fields & orchards. 9000 years the man is plowing the selfsame field, as the travellers pass, as the pilgrims, merchants, warriors pass, some to go on, others to fall, adding layer upon layer cycle within cycle, the periods of time.

I took the bus back to Jerusalem & didn't go out for a week. In the afternoons I'd sit on the roof & stare out across the desert to where 14 miles & 3000 ft down I could barely make out the dark greens of the palm groves that surrounded Jericho. Jerusalem lay to the west at my back, lost in its period of occidental exile. Whatever dream had brought me here lay behind me now. The images had dissolved, the veils been removed. The dream it was had been. Time had lost its hold. The dates swirled, where was it exactly where we were or are. Is Jesus coming or is he gone, did the temple exist or was it destroyed. The sons of Abraham Ishmael son of Hagar first born then banished struggles with Isaac son of Sarah, each considering the same land their birthrite. And ancient story as old as time, brother vs. brother. Who has the time to keep listening? & yet we all do.

> Whose one God is the one God? Because we are close to them, the jealousy is stronger. Ishmael is close to us, close to our one God, and therefore, they have the feeling of jealousy. We say that we were chosen of all the peoples, and they say —

> No, they were. We say that we came from, Sarah, & Hagar was her servant, & they say it was the other way around.
>
> – *Jacov Tsadok Lider*

Captured & captivated by paper, holy text & TV to the oldest soap opera, Ishmael vs. Isaac or will the Messiah come? Perhaps he's gone anyway they blocked his gate. So what to do.

> When you say Allah, the gate opens. It will be opened for anybody who wants. And when you come inside, you open the heart.
>
> – *Hadji Nur*

Immerse. Immerse back to the river, back to Jordan where one day during *Ramadan* the man pours water over us. & each time it is clearer. The path to peace is in peaceful living. Gradually the foreignness dissipates, successful time travel. We lose the date & find the palm. The house disappears only to reappear as does the garden & the book. The group begins to merge as we let go of the time line & begin to dwell in the emptiness of time rather than the line of time.

> The respect of the human being to the human being & the love of the human being to the human being is of the knowledge of the truth, the straight knowledge which has no illusions.
>
> – *Sheikh Hazim of Amman*

One day we all visit a *wadi* far out in the desert. We go there after visiting the tomb of Moses past bombed out tanks where in vast silent space we climb down crumbling sandstone to a thin green line on the desert floor below. Upstream past shepherds hauling water in old innertubes over the backs of burros, & I can't remember is it Wadi Kelt or Canyon de Chelley we go further upstream wading now deeper & deeper into paradise the sweet water, the rocks all covered with wild flowers, palm fronds & waterfalls, tiny hummingbirds flashing irridescent in the sunshine against the lichen dappled rock until finally we reach a place where the rock cuts the stream cut the rock by a tunnel & the only way forward is under the rock, thru the tunnel, eyes burning lungs straining to the distant lite.

Where one emerges into a canyon which is what one always imagined the Garden of Eden to be & we are all there together all of us who live together & that nite when we get home the home changes again.

One morning I wrote in my journal, "everyone now knows that reality is a myth & our reality is the myth we are living. We have found a time machine & we are living in it. Everything that has existed is still existing in the present. Time is like a radio that one tunes thru the bands to whatever program one wishes given that one can turn the dials & read the instructions. Nothing is happening." Later that day we go south to Al Khalil (Hebron), resting place of the father of the three, Ishmael, Isaac, Issa, the tree, Abraham, Ibrahim, the closest & the nearest. Here was another dimension, the old stoned back street city where, attended by the noble Hassan, we met the grandfather, 135 years old with eyes now blind that saw backwards but who, when he held my head to bestow the blessing, I knew not if he were 135 or four thousand so certain was I that it was Abraham himself who blew the hu down the reed of my spine.

> Our business is to care for everyone the same no matter what belief or country or color & to be sure there's love in the middle of it.
>
> – *the Grandfather*

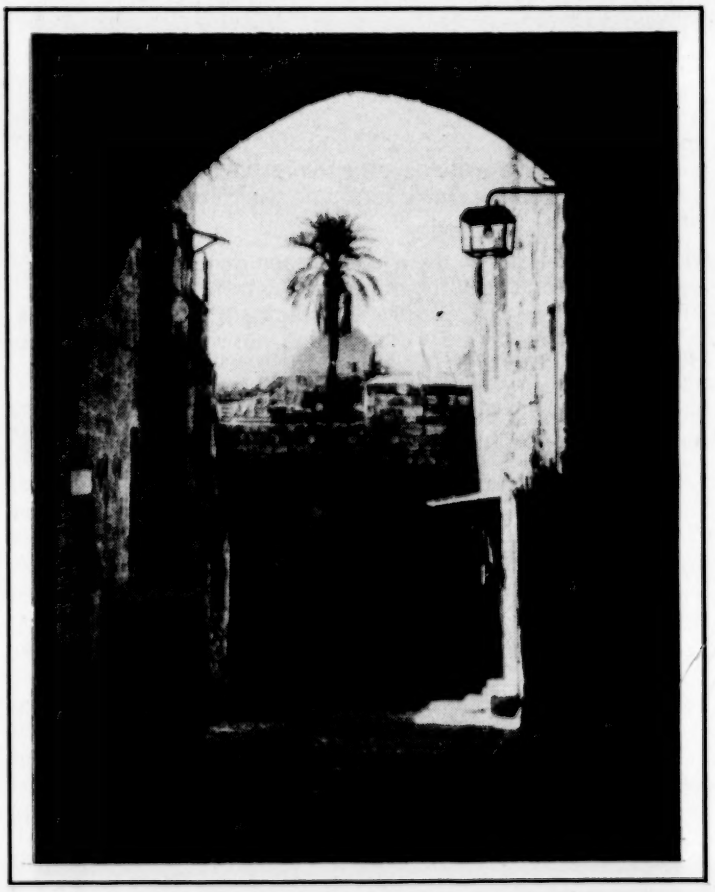
The book & the garden take on different dimensions as we do. What is "the book" in the land of the book: Torah, New Testament & Holy Koran? Who were these people, inhabitants of the Holy Land, who spoke what was spoken so long ago? As for the garden, we had entered the garden, where we now dwelt that the message began to emerge.

> You are the person who has the secret of the names of God. All the secret things of the name are put in you. When you will be like that, then you will be the Koran, you will be the words of God, & the people will come to read you.
>
> – *Siddi Sheikh Mohammad*

It was as if all the horror that surrounded us & which previously we had been reacting to had been passed thru & remained only peripheral at the edges of awareness. It was not that it had disappeared, as in typical example, walking thru the Arab section of Jerusalem, I am put up against the back wall of a shop by an Israeli plainclothesman "to see your papers please," but that all of that is seen for what it is. Peace has ceased to be something sought or gained & has become a way to be lived independent of the external realities as tanks become trees & the phantoms dissolve into empty sky.

> All life is a mystery, & this city partakes of the mystery, as does every city, every person. The world walks towards unity, towards realization, where there will be neither Jerusalem nor Babylon: all these are images: Babylon is the city of sin; Jerusalem, the city of glory & peace: these are only signs & images which represent states of the mind.
>
> – *Paco*

Members of the group with the Grandfather in El Khalil (Hebron)



Bab-I-Silsila looking toward Dome of the Rock

No longer is peace seen as the absence of war but rather peace is a state of being having nothing to do with economic implications or political situations. Peace is eternally blooming within every moment & every space. The soldier with his gun becomes a young man of 19-20, proud, confused & slightly neurotic, someone to talk to as he searches us one nite or as one day during a very tense confrontation over inflation/food prices/occupation policy I watch Hassan go up to the commanding officer (whose men are being stoned from the roofs) & kiss him while shaking his hand & for an instant completely cooling him out & when I watch the officer turn back to the men & the scene he is now somebody in charge of controlling a crowd, not ordering a massacre. Subtle moves made from a state of fearlessness as there is nothing to fear because nothing is happening. Or it's all happening but there is still nothing happening. Elias tells us a story of walking out a door one day into a fusilade of machine gun bullets. He says he could see each bullet pass by as he kept on walking because he knew that what ever was happening had absolutely nothing to do with him.

I realize it is all true. Jerusalem is the place of peace or at least a place where I began to really understand what peace is & so for me the place of peace.

> There is a season for apricots, there is a season for apples, etc. so for the as'adi there is a season also. When the ma'adi comes all the electronics will stop, the cars, planes, rockets. Everything will stop.
>
> – *Hadji Nur*

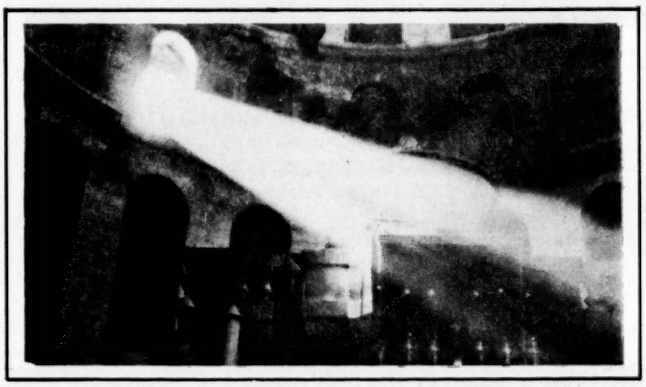
As the group became more immersed in the state of peace the gates began opening to us as we continued our erstwhile interviews, in reality creating spaces wherever it was we went. You must remember Jerusalem is a very compartmented city with certain people, creeds, sects maintaining exclusive (in every meaning of that word) control over all sorts of situations, holy sites, pieces of land & points of view. We simply made a list of all these various types & went calling upon them, illiciting their views & engaging them in conversation. I don't think anybody imagined what we were really doing & a few days later they would show up at the house wanting to continue the interview. One day I counted an Arab politician, a rabbi who had grown up in Jerusalem, an Anglican minister 27 years in India now maintaining a center in Jerusalem, five students from a conservative yeshiva, a Christian Arab who worked for an Israeli paper, 6 radical Palestinian marxists, a sufi murshid & entourage, a guardian of a tomb of one of the prophets & a muslim judge who had the wisdom of Solomon, the oud player who drove a truck, a tri-literal translator/guide, plus four students of the roshi who, as it turned out, ran a zendo on the other side of the mountain.

We had no plan (all of them having been demolished), no voice from the past telling us how it ought to be. We had only the time we had, the precious moment of eternity & the sure knowledge that everything which was sought was within that moment. So the bride continued to grace us with her presence. Days flowed into nites & lite came out of nite, the flow continued until the end which never came. For while I am here on this mountainside I am also there in other bodies.

> Anyplace is a house of God. Pray anyplace. God gave this earth to me to be a mosque.
>
> – *President of Muslim College, Hebron*

> You see I don't feel you have to pray at the wall . . . you can pray in your house, you don't have to go outside. . . I like to go on the hill at night & breathe the air & look over Jerusalem at the lights. . .
>
> – *Israeli civil guard*

> Where is the sacred space where Christ meets the believer? It is in the assembly of the community wherever that community meets in his name. Wherever Christians meet in love for one another & for all others in union with Jesus, there is the place of the Resurrection. The whole point of our religion is that the tomb is empty!
>
> – *the Ex-Archbishop of Galilee*

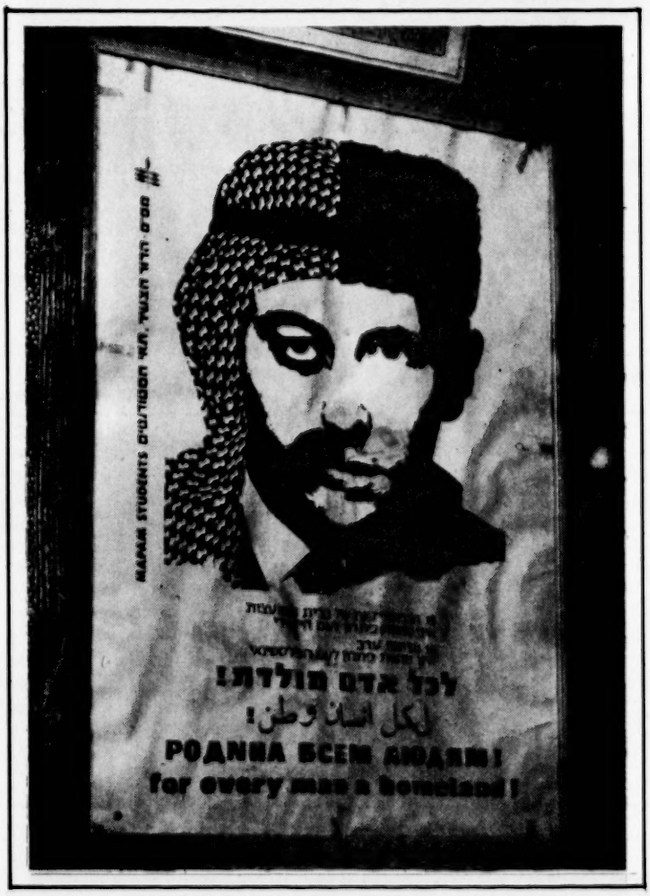


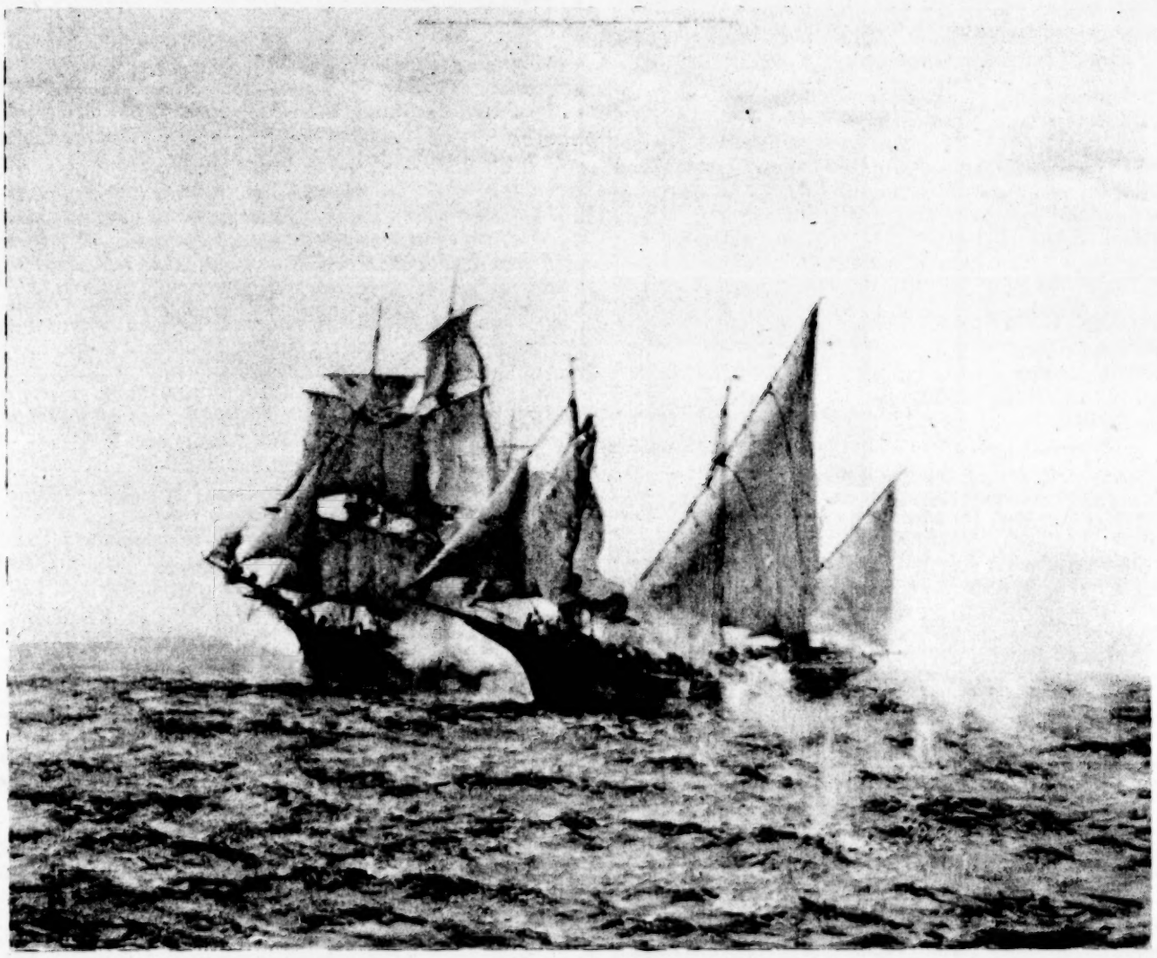
Morning sun on the empty Tomb of Christ in the Church of the Holy Sepulcher

Finally most of us had to leave that Holy Land as coin ran out & children & families called from the other shore. There really is no end to the tale & this is just a few moments skimmed from the flow of mind & heart. We all plan to meet this spring & work some more on our garden in New Mexico, & continue our work together on "The Book" which is now tentatively titled 'Jerusalem, a Garden in Flames.' We also hope to be allowed to return again to Jerusalem & the Holy Land perhaps on our way to Shiraz, but that's another story.

The work in Jerusalem on "The Garden" project is at a relative standstill due to lack of funds to make the next steps & we are still without a publisher for our book. Our "man in N.Y." kinda backed off gracefully. Perhaps it was the need for tri-lingual presentation of the material or some of the more political interviews. In any case if anyone out there is a publisher, or knows of one, who resonates to this material, we are open. As it is now it will be camera-ready autumn of 1975, 5735, 1396. We can be reached at Box 444, San Cristobal, N.M. 87564. ■

A salaam u aleikhum Peace *Shalom Aleichem*





Softwar thoughts

Now about softwar. I've always sensed a paradox about my soft end of the hard-soft school. You walk out from the spacewar educational bunkers across the stage and into all this soft grass and trees and stuff. Once when I tried to write it as a novel people started building walls in the grass. This evening a bunch of boys (11 or 12 years old, perhaps smaller) were out playing late in the grass of Toronto Island, being tough and rough, leave me alone with this guy, and now they're gone off to supper. Outdoors is war-space, also at-one-with-the-birds space (has anyone built a house of living material yet, grown trees for walls, bamboos for windows?) and sometimes its the best thinking space there is. The Second World War was the first indoors-war (think of the wooden battleships being pushed about the charts, the men inside the battleships themselves, or tanks for that matter. You got killed indoors. By telegraph. Or bombed in your home. (Peter Watkin's statistics about % civilians involved in succeeding wars, etc.)

The bit about the spacewar hack *[in* **II Cybernetic Frontiers***]* who wanted a whole fleet is more important than it looks. The popularity of hardwar movies (documentary as well as fictional) seems to me to rest in the love of the brains-behind-the-battle, contrasted with the man-in-the-trench(coat) . . . you want to grapple with a complex whole.

Tonight I think soft-war is a nineteenth century naval battle. There was something about Nelson, Villeneuve and those ones, I wonder what. Let's see. The struggle took place at sea, out of sight of the majority of people. It consisted of bloody clashes between machines of great beauty which moved slowly (harnessing the wind) manned by hundreds of people who had to work together to make the whole lunatic event possible. There were small frigates, large ships, and a system of prize money, awards based on the number of vessels in sight of the action. There were no women.

There's a formula, a game in there somewhere. You see most of the time the players were fighting wind and wave. For months and months they would beat up down blockading some port, enduring staggering hardships of ship-board life, keeping very healthy, and the reward was a few fierce hours of cannonballs. The Kon-Tiki was the same pattern in a way, months on a sinking raft and then an hour on a reef, and a South Sea Island for prize-money. The headline in the Toronto Star Sports Section tonight: A RAY OF SUNSHINE IN FOOTBALL STRIKE.

Anthony Barton
Toronto, Canada

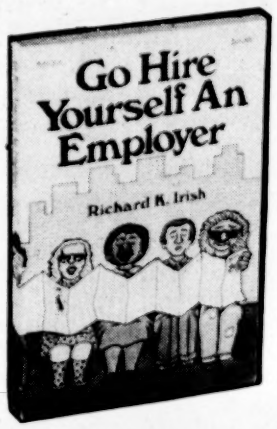
P.S. Rubber cannonballs.

Go Hire Yourself An Employer

How to get a job doing what you want to do. Everyone who has ever been unemployed knows that help wanted ads, employment services, and their ilk, don't do you much good. This book shows some better approaches. Advice on interviews, how to write a good resumé, what to do when you quit (or get fired). The style is brusque and slang-ridden, and sometimes sounds pretty stupid. But don't be fooled. There is a solid core of real information here.

— William Bonney

Go Hire Yourself An Employer
Richard K. Irish
1972, 1973; 152pp.
$2.95 postpaid
from:
Anchor Books
Doubleday & Co., Inc.
501 Franklin Avenue
Garden City, L.I., N.Y. 11530
or Whole Earth



Never, never, never look for a job — always interview for information. Let's say, biostatistics is your trade. You work for a small, wealthy, but stagnant firm whose management will never admit you to its ownership. You want to find a firm — the same size — with growth potential where you can own a piece of the company. Because Uncle Sam takes more than he deserves (and you can afford) after the first $25,000 in salary, you know a piece of the stock action is the only way you're going to survive.

So, spend your early mornings, lunch hours, or the late afternoons checking out firms you might want to work with and who might need your skill. (Remember, one of your skills is knowing how to find a job.) You stake out the key people in each company, the men and women you would want to work for and from whom you can learn, and ask their advice on how to move up in your field. Always obtain the names of four more key people and companies from each person you interview and before long you've snowballed your job campaign into fifty interviews and, I bet, four hidden job offers.

Notes

- **The easiest measure of a commune** *is the quality of its cash crop. (If it doesn't have a cash crop it probably won't last long.) A nice sample of the trend is this Don Hollister paragraph in* **The New Journal**, *Vol. I, No. 2: "I use Clear Light film, marketed by Universal Color Laboratories, run by the Dinky Universal Church, a spiritual work family. Our local organic grocery sells granola made by the Yellow House commune in New Hampshire. We cut bread made from flour milled in the Vale community on hardwood cutting boards produced by Woodworks of the Ithaca Alternatives Fund. I brush my teeth with Weleda toothpaste from the Threefold Community in upstate New York. And so on."*

- **Home-care for hay fever** *of Donald C. MacDonald's, Minneapolis, Minnesota: "Eat one or two heaping teaspoons of locally-produced bee pollen pellets (available from nature food stores or local bee cultivators). One builds total immunity, and needs no Contac, Allerest, etc."*

- **A physician's assistant** *is not exactly an American version of the rural Chinese barefoot doctor, but the step is in that direction. Training programs at some 40 colleges last two years (a few are one years). A guaranteed-return skill investment, economist Dale Jorgenson would doubtless call it. Applications and inquiries:*

Department of Allied Medical
Professions and Services
Division of Medical Education
American Medical Association
535 N. Dearborn Street
Chicago, Illinois 60610

— SB

- **Menstrual Sponge.** *Stewart said, "Would someone try this? I can't." So I tried using a cosmetic sponge, available in any drug store for no more than fifteen cents, instead of a tampon. This was suggested in* **The Monthly Extract**, *a women's newsletter which is published to help women rightfully reclaim their own bodies (six issues, $3.50 from New Moon Communications, Box 3488 Ridgeway Station, Stamford, CT 06905). They said, ". . . we just take it out, rinse it, and reinsert — saves a fortune in tampons — money that stays with women!" I found using the sponge similar to using the diaphragm. It's easiest to insert if you roll it up so it resembles a tampon before inserting it. It then unfurls in a lazy, sensual way while doing the job.*

— Pam Cokeley

Friday, February 7, 1975

down at smitty's once again
living out the payday whims,
hunkered in with a tall bud,
a long stick,
and my initials on the chalkboard.
waiting for to shoot some pool.

a long legged chinese lady has the table,
velvet manners,
a clean eye,
a soft touch,
and the patience to put up
with the shit,
that any good woman pool shooter hasta get,
in a pinkneck bar like smitty's.

(whiskey love,
lean over.)

i'm five names down the list,
the lady dispatches the first four
stroke by stroke,
bank by bank.
the eight ball loves her too,
i fish a quarter out of my jeans,
chunk the balls out of their corporate prison,
rack them straight and tight,
chalk my cue,
and watch her nice yellow tits
down there in the j.c. penny's flannel,
as she focuses in for the break.

(whiskey love,
lean over me.)

i never get to shoot.
she makes all the solids from the break,
i am not there for her.
i am there for the machine,
the quarter eater.
she does smile at me once, though,
just before she calls the eight,
straight in the corner.
i had hoped for a long teasing game,
a ball nudging,
snookering contest.
instead, she rapes me,
knocks the balls in fast and true,
erases my name,
and asks the next fellow to feed the machine.

(whiskey love,
lean over me longer.)

— J. D. Smith

The Medicine Show

The CR Editors generally have a pretty dry style of writing, and this book fits the pattern. But Medicine Show *is anything but boring. In it, they cooly demolish most of the patent medicine industry, product by product.*

You probably already know that mouthwashes have been declared therapeutically no better than plain water by the government. You may even know that over-the-counter cough syrups are virtually useless in stopping coughs. But unless you've already read this book, you undoubtedly will find some product in your medicine chest or first aid kit that is either totally useless or more harmful than helpful . . . (merthiolate? burn cream? cold tablets? buffered aspirin? vitamins?)

But it's not all muckraking. For every "medicine" MS attacks, it substitutes the best home remedy science has found for the problem, if any exists. Interestingly enough, many (but not all) of these "best" remedies are the old-fashioned type you're likely to find in the likes of the Mother Earth News Almanac.

Medicine Show *reads like an exposé but works beautifully as a household reference, paying for itself over and over in the process. And it's one of the best ways out of the TV drug culture I've seen.*

— George Beekman

The Medicine Show
Editors of Consumer Reports
1955, 1974; 369pp.
$3.50 postpaid
from:
Pantheon Books
457 Hahn Road
Westminster, MD 21157
or Whole Earth

A world of fiction has been created about hypoglycemia. For a variety of reasons, many people undergo periods in which they experience fatigue, insomnia, irritability, faintness, depression, and a host of other burdensome complaints. Few such people suffer from low blood sugar. Low blood sugar in and of itself — and unrelated to a specific physical disorder — is seldom responsible for such complaints. Nevertheless, a small number of determined physicians tends to attribute many of those emotional disorders and vague feelings of being unwell to low blood sugar. The treatment they prescribe consists of a low-carbohydrate diet and periodic injections of adrenal cortical extract (a relatively weak extract of hog and beef adrenals), generally referred to as ACE. These injections, of course, involve considerable expense to the patient. . . . According to CU's medical consultants, ACE is no longer recommended for this disease. *AMA Drug Evaluations* calls ACE "obsolete," and adds: "There is no known medical use of this drug."

Cheap vitamins

Bronson has the best prices on vitamins that I've found. They have a wide selection, their service is fast, and everything is shipped postpaid.

PRICES: (this is just a sample)

Vitamin E . . .	100 IU . . .	100 capsules - $1.57
		250 capsules - $3.54
Vitamin C . . .	500 mg. . .	100 tablets - $1.29
		250 tablets - $2.91

Bronson Pharmaceuticals
4526 Rinetti Lane
La Canada, Calif. 91011
Catalog - free

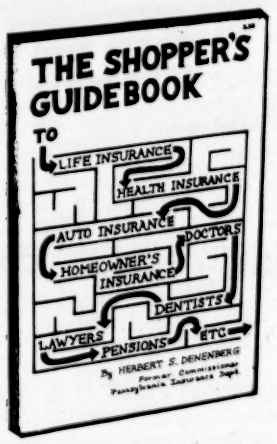
— Michael White
Petaluma, California

Shopper's Guidebook to Life Insurance, Etc.

All of us hate having to buy insurance and professional services, so most of us avoid the subject, remain ignorant, shop indiscriminantly and don't get our money's worth. If you're ready to face up to it, this guidebook, a collection of booklets originally published by the Pennsylvanian Insurance Department, offers a good basic education in how much security you need and how to provide for it.

— Andrew Fluegelman

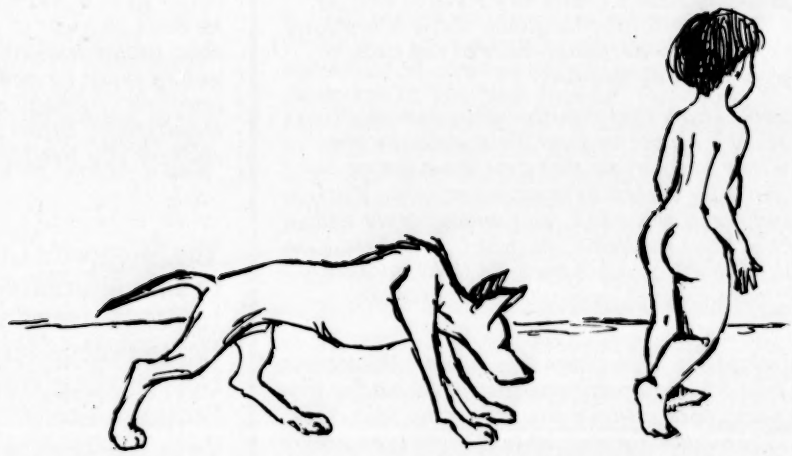
The Shopper's Guidebook to Life Insurance, Health Insurance, Auto Insurance, Homeowner's Insurance, Doctors, Dentists, Lawyers, Pensions, Etc.
Herbert S. Denenberg
$3.50 postpaid
from:
Acropolis Books Ltd.
2400 17th St., N.W.
Washington, D.C. 20009
or Whole Earth



15 Questions To Ask About Your Insurance Policy

1. Is the company's loss ratio over 50%? (The higher, the better — See Chart.)
2. Does the policy cover both illnesses and accidents? (It should.)
3. Does it cover all or most accidents and illnesses that may put you into a hospital? (The more it covers, the better.)
4. Does the policy offer service benefits (full coverage) or does it offer benefits on an indemnity basis (up to specified dollar amounts only)? (Service benefits are most advantageous.)
5. If it provides indemnity benefits, do the benefits cover at least a major portion of the daily hospital costs and surgeon's fees in your area? (The higher, the better.)
6. Is there a waiting period, for instance 30 days, during which new illnesses will not be covered? Is there a longer waiting period, for instance six months, during which coverage for specified illnesses or diseases is likewise excluded? (The shorter the waiting period and the less it covers, the better.)
7. Is there an exclusion against coverage for pre-existing conditions? Is it longer than one year? (More than one year is too long.)
8. Are there exclusionary riders limiting your coverage in important respects? (There shouldn't be, except in unusual cases.)
9. Does the company receive one of the two highest ratings for financial stability from *Best's Insurance Reports*? (It should — See Chart 1 to find out if it does.)
10. Does the company offer fair, efficient, and courteous claim service? (It should.)
11. If you are applying for family coverage, does the policy provide automatic coverage for infants from date of birth? (It should.)
12. If you are applying for family coverage, is there a waiting period for maternity coverage? Is it longer than 8 or 9 months? Are the benefits adequate to cover the costs of pregnancy and delivery in your area? (If you need maternity coverage, make sure you have it.)
13. Can the company cancel your policy? If so, when and under what circumstances?
14. Can the company raise your premiums? If so, when and under what circumstances?
15. Are you buying a mail-order policy? (Beware of deceptive advertising.)

If you follow these hints and try to get all the coverage recommended, you'll probably end up buying at least two different policies. First, a broad hospital/medical/surgical policy to provide basic protection; second, a major medical policy to provide back-up coverage for serious illness and those five figure medical bills.



Definitive dog food letter

Re: Dog Food

Dear Whole Earthers:

There is concern these days about the extravagance of feeding pets in a food short world. May I share some thoughts and a suggestion or two with you. Perhaps you will find it useful somewhere.

I have lived on several occasions in places where there is no garbage, where everything is used for survival and the very ground is licked clean. In one of those places, a highland Indian village in the mountains of Mexico, the people raise pigs, chickens and all of them keep dogs. These people have retreated further and further into the mountains, trying to maintain their culture against the Mexican advance. It is no joke there when someone says they fell out of their corn field, for the land is steep – and the crops are poor. These people sell their pigs, chickens and eggs because they are too poor to eat the protein they raise, they must buy the corn they need to survive and that their poor fields don't always supply. A wealthy family in this village is one that shares a chicken a week.

The dogs, pigs and chickens scour the ground together for what they can find. A dog is a pitiful creature in that world. They live with their nose to the ground and their eyes up, looking for the competition or the annoyed kick of an Indian who wastes no energy on sentiment for a day. Each family keeps a dog, and each dog guards his family jealously and fiercely. What is their relationship?

I visited on many occasions the home of one family. They had a dog who periodically tried to creep into the house. On each occasion the woman would pick up a stick and threaten the dog until it crept out again. Then one day I understood. Babies wear no pants there. One day the baby shit all over itself and its mother – obviously, under the circumstances, a not unusual occurrence. Then the woman called the dog and the dog quickly cleaned up the baby and the woman's dress. And that, folks, is what dogs are for in a poor village they eat garbage and they clean up vomit and shit.

(Friends of mine ate mushroom in a Mexican village once, and when they saw the dogs come in to clean up the vomit, they thought they were halucinating. I had to tell them it was standard operating procedure.)

Now that we've established that end of the spectrum, we can think again about that Newsweek article on fancy folks and their fancy dogs and gourmet restaurants for the canine set and we get a renewed perspective on decadence.

Now may I suggest some middle ground for those of us who are dog lovers and hopefully not so decadent and fortunately not so poor:

1. Buy dry dog food such as Gaines or Purina in as large a quantity as you can afford, can carry, and can store without waste. (A plastic covered garbage can with a tight fitting lid makes a good container.) When you add a new supply, pour what's left of the old out, put in the new, put the old on top so it's used first.

2. Dry food should supply all the dog's needs. Have it on hand to assure your dog a balanced, adequate diet. Then use it as little as possible.

3. Keep a covered container in the refrigerator. Into this container go ALL edible scraps, and I mean ALL. Scrape the dinner plates into it. If you peel vegetables, save any that are edible – even the little top and bottom of the carrot that we usually trim off. A scrap of baby food that you don't want to reheat a third time? Into the pot. Something forgotten in the back of the refrigerator and you're not sure you should eat it? Into the pot. I add a little water to cooking pots and warm it scraping up bits of food or juices – it cleans the pan and adds food for the dog.

4. Hopefully, have a pressure cooker on hand. (Pressure cookers take 1/3 the time – that means 1/3 the energy needed to cook anything and they preserve flavor and vitamins. And they work on any heat source.) Dump the whole container of "garbage" into the pressure cooker and voilà, dog food. If there's not quite enough to make a meal, make up the difference with the dry dog food. To make sure the dog eats a balanced meal, however, best to set a reduced amount of the dry meal and make up the difference from the dog stew.

5. If you have a puppy, especially a dog that's going to be big, it's important for them, as for all growing things, to have more protein. Feed as much meat or fish protein and bone as you can manage. Buy what we consider "waste meat" from the local butcher shop, including heads, entrails and bony parts. Add them to the pressure cooker for your stew. (By the way, the pressure cooker will make most chicken bones safe for the dog. From a whole carcass you should wind up with four long bones to discard – enough soup for a family and lots of dog food, and the latter includes all the joints and small bones now soft enough to use.)

Support dog population control, people population control, and take good thrifty care of all those already here.

Here's to moderation,

June Hiatt
San Juan, Puerto Rico

P.S. A review:

Don't think you mention anywhere in Whole Earth Catalog & Epilog the KitchenAid mixer made by Hobart Manufacturing.

Hobart makes commercial food preparation machines. They also make three mixers, a disposer, a dishwasher and trash compactor for household use. I understand all their products are good, but the only one I own is the mixer and I can tell you about that.

It costs, at discount, three times what any other mixer would cost you. Suggested retail is $145 I think. I managed to get mine for $90. (That's the medium sized one.)

I think it's fantastic, one of those rare things these days that really does the job. I am reassured by it that good tools are still made. I get the feeling I can look forward to using it the rest of my life.

It has a 1/4 horsepower motor. It kneads breads, mixes up the stickiest cooky dough and can whip a single egg. It has a special rotary motion that gets the beater into the sides of the bowl so you don't have to keep scraping things into the beater. Just turn it on and dump things in. Comes with a good basic, old fashioned cook book.

Attachments: this one motor now drives my meat grinder, my ice cream maker, my juicer (citrus, not a juice extractor) and a food slicer (makes potato chips). I didn't buy, but there is also a can opener, grinder-polisher, sieve (for pureeing fruits and vegetables).

For anyone who likes to cook, enjoys using good tools, appreciates quality, I consider it The mixer. It would be especially good for large families – it's a work horse.

By the way, the people I've met who work for Hobart seem to love the machine too – they talk about it almost lovingly and get a little wistful about how hard it is these days for a good piece of equipment to compete with the junk on the market. I guess what it comes down to is whether you want to spend a lot now and have one mixer, or buy an inexpensive one now and wind up with repair bills and having to buy two or three before you're through cooking.

Check the yellow pages for dealers, available most places, and listed under Hobart or KitchenAid. I think it's fair traded, but check discount houses (like GEM) for the best buy. It's really expensive – pay as little as you can for it or buy a used one if you can find one.

Blenders: I took Consumer Reports suggestion and bought an Osterizer (mostly to make baby food). I'm sorry I did. Not long after I had reluctantly purchased a plastic concoction with lots of buttons and knobs, I found out Oster makes a commercial blender.

For $5 - $10 more, you get a stronger motor, a metal housing (my plastic one melted when it got close to a hot pot) and a single dial that gives you Off and three speeds – absolutely all you need and easier to keep clean.

Usually found at good hardware-houseware stores or at restaurant supply stores.

By the way, somewhere you should list the values to be found by frequenting restaurant supply stores, especially those that sell used equipment – you can get restaurant silverware, good plain heavy dishes, good functional glasses and cups, and an incredible selection of heavy duty, no-nonsense kitchen equipment of every description.

Also, turn your readers on to laboratory supply houses as a source of glass storage containers, build your own still, and various other equipment of general interest and use. Makes great rainy day reading if nothing else.

Unhooking

The Hussel and my feelings
as to it's effect.

We are influenced by each energy surrounding us – why not spend time as easily and truthfully as possible.

Those who pay for sexual fun and companionship, even those who think they really want to, have some unfortunate reason as to why they bother to go out of their way. Most often they are very aware of these personality quirks and quite often the rest of their Life Style reflects as a mirror.

Then there is the developed attitude of those who charge their intimates for sex. No matter how the situation is approached – hard core bucks or the romantic giving illusion the underlying motive is the money. In itself the desire for money is healthy but after many successful sexual-monitary mind patterns are set it is not going to be easy to separate sleeping with someone and the reward of a $100 bill.

My personal love & sex life found itself constantly challenged by the response patterns being paid for pleasure, had stamped in my mind. The price for living the easy money life turned out to be far too expensive.

Then there is the time limit factor involved in the hussel. The come on is strong – most of the energy is used in the sales pitch. You have developed a smooth follow through – then it is over. All fairly quickly. You've got the cash but not much else to hold on to. Alas most of us good or not get more involved with setting up the hussel then the follow through. Look at what happens when we try to live the rest of our life only starting projects. One level does effect our other activities no matter how together we think we are.

The more we grow mentally the less room we find is left for the negitive associations that surround the life of husseling.

Not one of us can say that we have not felt the nationwide effects of our personal greeds and insecure personalities. Why contribute any longer?

Do you really want to hussel at yourself's & other's exspence just to live?

After living it – my conculution can only be:

Why bother

More comes to me with giving then selling.

Now I just gotta remember how to give.

– Maude Tillinger
Moraga, California

Jack and the Monster

Readers of **Divine Right's Trip** *in The Last WHOLE EARTH CATALOG might like to know a bit more about Gurney Norman.*

He spent 30 of his 37 years in Kentucky. His father a coal-miner, he considers himself a mind-miner. He was in the Creative Writing Program at Stanford in 1960 with Ken Kesey, Larry McMurtry, Peter Beagle, and James Baker Hall. He did two years as an Infantry lieutenant and two as a fire lookout. In the mid-60's he was editor of **The Hazard Herald,** *a town newspaper in Kentucky. Except for regular visits homeward he's been in Menlo Park, California for the last six years.*

The tale below and one to follow in the next issue will appear in a collection of Gurney's stories called **Ancient Creek,** *being published by Random House late in 1975.*

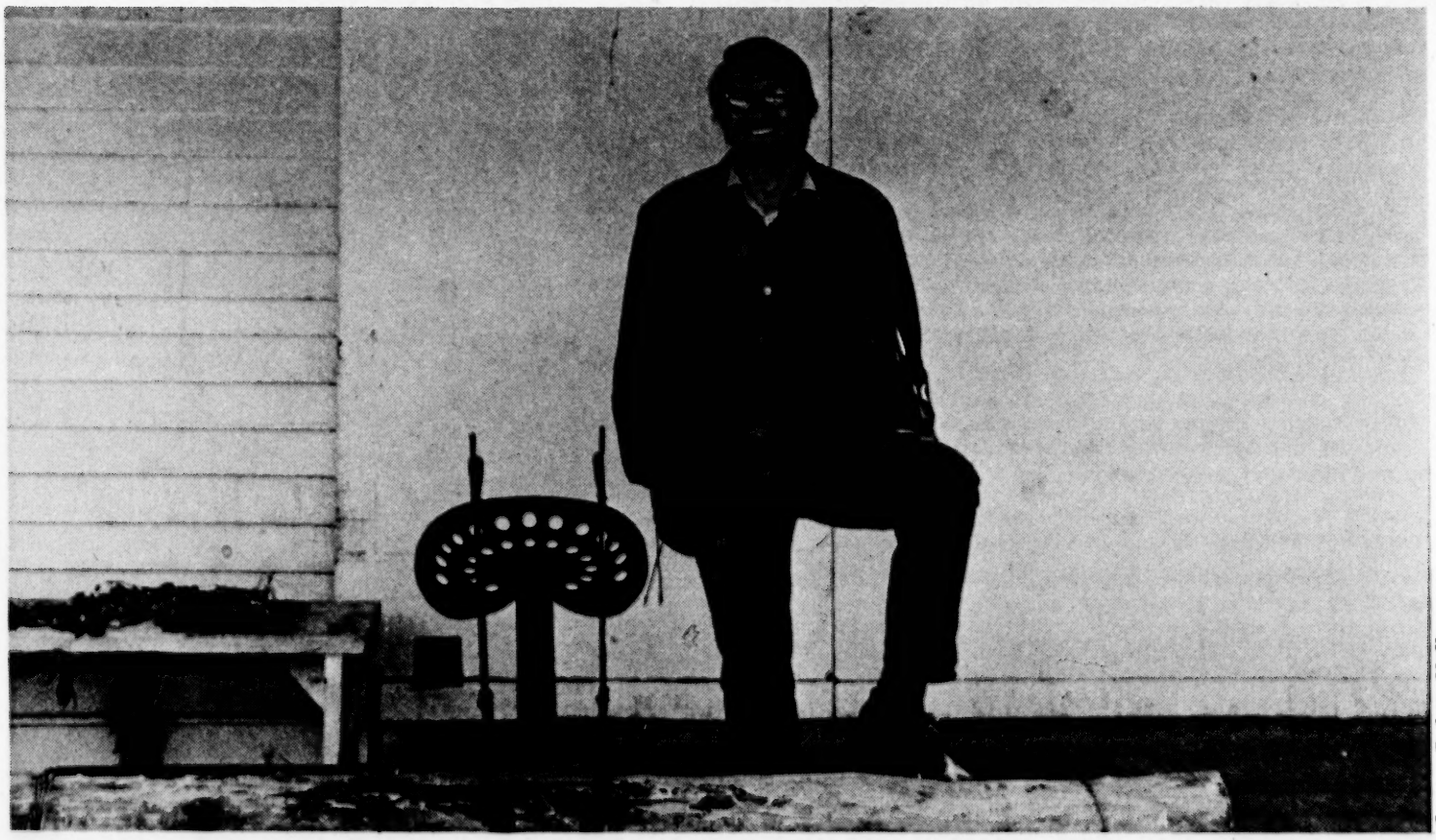
– SB

BY GURNEY NORMAN

INTRODUCTION TO JACK

When white people first settled in the Southern Appalachian mountains in the 18th century, they brought with them, in addition to their tools and skills, minds loaded with imagery from their Anglo-Celtic origins.

The settlers were from the British Isles mostly, England, Scotland, Wales and Ireland. Many were Scotch-Irish, descendants of people twice transplanted, from Scotland to Ireland, and now across the waters to the "new world."



James Baker Hall

Although these people had come to live in a new world, the stories and songs, the legends and lore that filled their talk and their dreams, were very old indeed. Among the stories brought "across the waters" by these settlers is a series of tales known as the Jack tales.

We all have heard the story of Jack and The Beanstalk. But it isn't commonly known that this same legendary Jack had many other adventures besides his contest with the giant who lived in the castle at the top of the beanstalk.

"Jack and His Comrades," "Jack and His Master," "Jack and Old Firedragon," "Jack in The Giant's Newground," are only a few of the titles of the score or more tales in which Jack appears as the hero, often with his brothers Will and Tom as secondary characters.

Aside from the tales as literary marvels in themselves, and the fact of their antiquity, the crucial fact about the Jack tales as far as present-day Americans are concerned is that they are still being told by Appalachian story-tellers who inherited them, live, from their ancestors.

There are of course not nearly as many traditional tale-tellers active in the mountains as there were before new roads and railroads brought the dubious benefits of modern American culture to the hills, back around World War One.

And by the time I was a boy growing up in the Kentucky mountains in the 1940's and 1950's, old-time story-tellers were definitely a dying breed.

But some tellers yet remain, and excellent ones. In recent years they have become the subject of another round of attention, not only from professional folklorists, but from the current generation of young people in the region, whose interest in and reverence for older people and older ways is a good deal stronger than among their counterparts in the cities. (See **Foxfire**. See the films from Appalshop.)

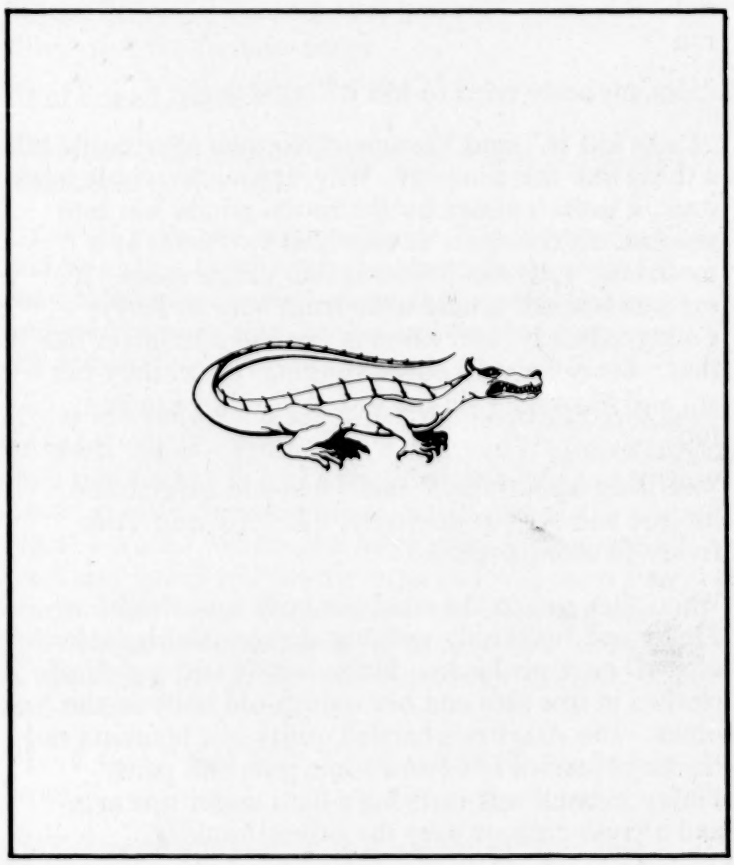
What these contemporary young mountain people recognize and appreciate is that story-tellers like Ray Hicks, of Beech Mountain in Avery County, North Carolina, are links in an unbroken chain of ancient cultural inheritance. They embody a living oral literary tradition that reaches farther back in time than even the scholars and folklorists are able to say precisely. Stories told hundreds of years ago in crofters cottages in the Scottish Highlands, and around peat-fires in peasant homes in Ireland, are still being told by Mr. Hicks and his fellow tale-tellers around the Appalachian region. And people are listening.

* * *

Meanwhile, here I am, Gurney M. Norman, grandson of Gurney W. Norman, (who grew up in Avery County, North Carolina and migrated to Eastern Kentucky in the first decade of this century) sitting at my writing desk, college-educated and Jungian shrunk, self-conscious and full of deliberate intent, presumptuously setting out to write original, "modern" tales featuring the legendary Jack, and his brothers Will and Tom.

What, one may well ask, is going on?

It would take more space than I have here to fully answer that question. And even with more space I probably couldn't, for in all honesty, I really don't know what's going on. When I write Jack tales, I'm operating out of instinct mainly. I'm curious to see what will happen when I mix my own imagination, and my perception of the modern world, with the stories I heard old men and women tell when I was a boy, with stories I have read, with certain kiddie cartoons I have seen on Saturday morning tv.



So far what's happened is three Jack tales, intended more or less as sequels. After "Jack and The Monster" comes "Jack and His Ego," (in the next issue of **CQ**). It's a story about ego as a monster, and the kind of help that errant heroes need sometimes when they stray too far from their neighbors and friends who are, after all, their sources. The third tale is called "Ancient Creek." That's a magical kingdom I know about, a wonder-working power-place on the ground. "Ancient Creek" is about revolution and defeat, about spiritual renewal, renewal of the earth, renewal of tradition, renewal of nature itself.

While it's true that I don't really know what I'm doing when I write my Jack tales, I am able to say that what satisfies me most about them is the sense that I'm participating in one of the more hopeful conversations going on in America, in this time of generally unhopeful talk. The conversation is about the latent power

of native tradition, power that, upon rediscovery, is released as a spiritual impulse looking to find expression in a healthy politics.

As people all over the country discover new uses for many of the old tools and skills and ways of living and relating, so are they finding new uses for traditional forms of art, and literature. Reading the old stories, listening to them, one gets a glimpse into the minds of earlier people, whose lives were incredibly difficult but who managed somehow, not only to survive but to thrive, as individuals and in community. One gets a glimpse of the sturdiness of people a few generations back, and by that I mean psychological sturdiness. No doubt they did their share of worrying, because the means of life were so uncertain. But worry is something different from what we moderns call anxiety. You can worry and still keep on keeping on. Anxiety immobilizes. As we can see through the old tales like the Jack tales, old-time people never lost their capacity for positive action, never lost confidence in themselves as people capable of action.

I take Jack's native energy, wit and ingenuity as qualities that begin to define courage. Jack is occasionally foolish and naive, and his foes may temporarily overwhelm him with an evil spell of some kind. But Jack is representative of the common people he lived among and who produced him in that, above all, he is never a quitter. Jack hangs in there, and with luck and pluck and persistence, and a little help from his sorcerer-friends, he usually manages to land on his feet in triumph.

ACCESS FOOTNOTE

The best scholarship on the tradition of the Jack tales has been done by Richard Chase, whose book, **The Jack Tales,** published in 1943, is a classic of its kind. Chase gathered other Appalachian folk tales and published them under the title **Grandfather Tales.**

Leonard Roberts' books, **Old Greasybeard: Tales From The Cumberland Gap,** and **South From Hell-Fer-Sartin** are equally indispensible to anyone interested in Appalachian literary tradition.

Ray Hicks' telling of the Jack tales is recorded on a Folk Legacy album titled "Ray Hicks, Folk Tales."

All these books, and the record album, can be mail-ordered from:

Council of Southern Mountains Bookstore
C.P.O. 2307
Berea, Kentucky 40403
(Catalog listing many other books, records, magazines & films on the Appalachian South available from C.S.M. for 50¢.)

Another good mail-order source for regional material is:

Cozy Corner Bookstore
Main Street
Whitesburg, Kentucky 41858

An excellent film about Ray Hicks, titled "Fixin' To Tell About Jack," is available for sale or rental from:

Appalachian Film Workshop
Box 743
Whitesburg, Kentucky 41858
(Ask for complete film catalog.)

Jack and the Monster

One day Jack was out in the newground hoeing corn with his brothers Will and Tom. All at once they heard this racket in the trees down the hill and Jack looked around and saw his cousin Vernon running toward him hard as he could run yelling, "Jack, oh Jack, come quick, a monster's loose and eating up everything from here to Kingdom Come."

Vernon ran on up to where Jack and Will and Tom were working. He fell over on the ground, huffing and puffing. Finally when he could talk he said, "It's the biggest old awful thing that ever was. It breathes smoke and roars like a grizzly bear and it's big as a barn, nearly. Made out of iron, got a glass head, it's already captured a man, keeps him locked up in his head, you can see him in there through that monster's eyes. All the people on Defeated Creek's done fled. The monster's eating the world up and coming right this way. Mommy sent me to tell you all to run."

"Has anybody tried to kill it?" said Jack.

"Can't kill it," said Vernon. "No man alive could kill a thing like this monster. Why, it knocks whole trees over, it pulls 'em out by the roots, grinds 'em into sawdust on the spot. It eats land two acres at a mouthful, spits out boulders like peach seeds. It's eat a swath half a mile wide from here to Perry County already, aint no man can kill a monster like that. Everybody I know's running fast as they can go, and Mommy told me to tell you boys to run too."

"We'll see about that," said Jack, and he grabbed his hoe and set out down the hill. Will and Tom followed along behind.

When they got to the road the boys saw Neighbor Finley and his family walking along with big sacks of stuff on their backs. Finley's wife had a sack of clothes in one arm and her month-old baby in the other. The daughters carried quilts and blankets and the boys carried food and some pots and pans. Finley himself was carrying a ham under one arm and a cross-cut saw over the other shoulder.

"Where you going with all that stuff?" said Jack.

"Aint you heard about the monster?" Finley said. "They's the biggest old awful monster that ever was running loose, eating up the world and coming this way fast."

"Where's it at now?" Jack asked. "Me and Will and Tom's on our way to fight it."

"Fight it!" Finley said.

"Yep," said Jack. "Why don't you come along and help us. If it's as bad as you say, we'll need all the help we can get."

"You get a look at that thing and you'll think otherwise," said Finley. "That monster get hold of you boys, he'll swallow you all down like sardines."

Finley shifted his cross-cut saw to the other shoulder and went on walking down the road.

"Well at least tell us where it's at," Jack called after him.

"Just keep on the way you're going," Finley yelled over his shoulder. "You won't have no trouble finding that monster."

And the boys didn't, either. Before they'd gone another mile they commenced to hear the monster snorting and roaring and crashing around up on the hillside. Before long they could see its smoke-breath rising in the air above the trees. As the boys started up the hill toward the monster Jack yelled, "Look out boys! It's throwing rocks!" and they all dodged just in time to keep from getting run over by a big boulder.

"This way!" Jack called out, and he ran around the hillside till he came to a rock-ledge big enough for all three of them to hide under.

"I'm scared," said Will.

"Me too," said Tom. "Maybe we ought to not fight this monster after all."

"You all hush and come with me," Jack commanded, and he led his brothers on up through the trees till they came to a clearing where they could look out and see the monster lurching and leaping and growling and roaring all about.

It was the evilest-looking thing the boys had ever seen or heard tell of. From where they hid it looked bigger than two barns. It had a snout on the front of it that would reach down and bite a chunk out of the ground big as a yard. Where the boys were hiding was all trees and laurel and pretty ferns and wet moss everywhere. But down there where the monster was, stretching out behind it as far as their eyes could see, it wasn't anything but yellow mud and broken rocks and trees.

"Lord God," said Will. "The end of the world has come."

"It'll sure be the end of us if we try to fight that thing," said Tom. "Let's give this up and go on home to supper."

"Aint going to have no home to eat supper in if we don't kill this monster," said Jack. "Look at it, it's heading right towards the homeplace."

"If we had some dynamite we might could blow one of its legs off," said Will.

"Could," said Jack. "But we don't want to blow that man up inside. We'll have to rescue him before we go to dynamiting."

"Poor feller," said Tom. "Watch at him, waving his arms all around, trying to get out."

"I'm glad that aint me in there," said Will.

"It'll be you if that monster gets hold of you," said Tom.

"You all listen now," said Jack. "I've figured out what to do."

Jack told Will to run back to the settlement and get all the dynamite, fuse and blasting caps he could carry and hurry back with them. Then he told Tom to run out in front of the monster and get its attention so he could sneak around and climb up the monster's side and break that poor prisoner out.

"I'll do my best," said Will, and he took off back through the woods and headed for the settlement to get the dynamite.

A minute or two later Tom ran out of the woods in front of the monster and commenced to dance in circles and wave his arms around.

The monster like to went crazy when it saw Tom. It roared like a waterfall and struck out at him with its snout. But Tom jumped back out of the way and kept on waving and dancing, and when the monster struck again, Jack ran out of the trees and leaped on the monster's side.

Its side was solid steel and there weren't many places to grab hold. But Jack still had his hoe with him, and he was a good climber. By sticking the hoe in the little cracks in the monster's side and pulling himself up by the handle, it didn't take Jack long to get up to the monster's head where the captured man was.

"Come on!" Jack yelled at the man inside the monster's eye. "Break out of there and we can get away."

But the monster was making so much noise the prisoner couldn't hear Jack, and he didn't see him either. He was looking out to the front where Tom was dodging the monster's snout. The monster came so close to catching Tom, Jack knew he had to act fast. He hauled off and smashed the monster's glass eye with his hoe-handle, then stepped in through the opening to drag the prisoner to safety.

But just as Jack did that, the monster caught Tom in its snout! Jack could see his brother out there plain as day, dangling like a worm as the monster raised him high to eat him.

"Oh Lord," thought Jack. "Poor Tom's gone for sure!"

The thought of his brother being gone made Jack so sad he wasn't sure he could fight anymore. But then he figured the least he could do was go ahead and try to save the prisoner's life. The only way to do that now was hit the man on the head and pull him out unconscious. So Jack did that. He swung with his hoe-handle again, knocked the prisoner out, then threw him over his shoulder and turned to leave.

But all of a sudden, the strangest thing in the world happened. Suddenly the monster stopped dead still. The monster quit its lurching and leaping, it hushed its awful roar, its big snout stopped in mid-air, with Tom still dangling down from it. The woods around fell quiet enough to hear a bird sing, and for a minute Jack couldn't believe it. He thought it was some kind of monster-trick, to catch him in a lure.

But then Jack saw Tom work himself loose from the snout and crawl right up the length of it to where Jack stood with the prisoner over his shoulder.

"We did it!" Tom shouted. "We killed the monster!" And then from his high perch he began to sing out across the trees to all the world, "The monster's dead! The monster's dead! Me and Jack killed the monster, and the awful old monster's dead!"

By the time Tom and Jack got back down to the ground with the prisoner, Will was back with the dynamite, along with a dozen men and women who'd come with him, wanting to help in the fight. By sundown that day a big crowd of people had gathered to look at the dead monster and the strange man that had been a prisoner in its head.

The prisoner was almost as big a curiosity as the monster-corpse itself. When he came to, the prisoner tried to fight Jack and Will and Tom. And even after they tied him down, he went on cussing the boys, threatening to kill them if he ever got loose.

"That monster's drove this poor man crazy," said Tom.

"It's taken his mind away," said Will.

"He'll be okay," said Jack. "He just needs to rest up and be back among folks for a while. We'll take him home and let Mommy feed him a good supper, he'll feel better after that."

Some of the people in the crowd wanted to go ahead and blow the monster up with Will's dynamite, just out of revenge for all the damage it had done. But Jack said he thought it would be better to just let it lie there so people could come and look at it and see what it was they'd all been so scared of.

So they did that. They left the monster there to rot and sink into the ground. The last I heard, it was there on the hillside. If you're of a mind to go up and study the remains, you can. ■

[Next Issue: Jack and His Ego.]

On being 28

1. Why I wear seatbelts now . . . I took a lot of chances when I was young.
2. Take or send your tape recorder around to oldest relatives and old timers who can remember your grandparents and your parents in their youth. Take time and care preserving and collecting this history for your kids. – History with a capital H which they'll never hear if you don't gather in the next few years or months.

Mark
Farmingdale, NY

EcoDog

Dear CQ

We thought we'd let you know that you are not the only ones interested in Ecology! We here at EcoDog have noted the trend towards smaller, less environmentally degrading, motor homes, and have responded with a smaller Chihuahua. Only 2½" long full grown, it's the perfect match for your Mini-Winnie! (Negotiations are under way to have them included as standard equipment.) The 168 decibel bark in the 15-18000 Hz range should satsify even the most discriminating fancier of small canines, while the insignificant appetite will aid in conserving valuable resources. A guard-dog version is a badger cross, and though slightly larger at 4"x4" it is only 1 inch tall, making it an ideal watchdog for toolchest drawers containing valuable wrenches. To increase efficiency and to reduce weight (got to remember gas milage, Ha, Ha) these dogs have only three teeth, which is all most Chihuahuas use to bite with anyway. Both versions can be equipped with exhaust gas recirculators which add but another ½ inch to their length and reduce emissions to a small "poot" of septic dust every 24 hours.

Let us know if you'd like a review demonstrator! We'd be glad to furnish you with one at dealer's cost ($367.00) as our way of helping us environmentalists to stick together.

Ecologically yours

Hernando Schwartz
Avenida se los Brujos
Ninguna, TX 00100

Action from Gov't.

I've found that one of the best ways to get anything out of the national government is by writing directly to your congressperson; the best way to gain results with a state agency (unless you have an unusually good state representative) is through a letter to the governor's office, although this approach may vary from state to state.

Bob Murphy
Sierra Club Volunteer
Boston, Mass.

Katherine Anne Porter's casket

Pam Cokeley was completely charmed by an interview that Henry Allen, Washington Post, *did with Katherine Anne Porter, who is 83. The article mentioned a mail order coffin which Miss Porter keeps in her closet. Pam wrote for details.*

– SB

Dear Miss Cokeley:

I am delighted that you saw Mr. Allen's piece about me because it was good-tempered and good-mannered and all together one of the most delightful things that was ever written about me. Gentle and friendly praise is precious at any time of life, but in this hour for me it is very treasurable.

I don't know why I forgot to give Mr. Allen the address of my coffin maker, but I shall do so today just after I have written you this letter.

Rocky Mountain Casket Company
P. O. Box 1245
Whitefish, Montana

I have been surprised at the interest shown in that story in this country which has almost been persuaded by the Undertakers' lobby that it is illegal to be buried without being pickled or embalmed and laid in a metallic coffin at the cost of several thousand dollars. I think we should spend a good deal of time telling people that it is perfectly legal to be wrapped in a blanket and buried in their backyard if that's what they like; there are many deadly cheats committed upon poor people that everyone seems to take for granted and that are no different at all from picking their pockets and everybody seems to think it is perfectly legal. This is what we really should try to put an end to. I'm so pleased that you're all going to get wooden coffins. Mine has been decorated all over with flowers and leaves in brilliant colors just the way they do it in Mexico. It has been a nice sociable pastime with people coming in and adding a little curlicue. My nephew is coming to spend Thanksgiving and is bringing his color box, he wants to get in the act. In fact, my wooden coffin has been a center of some very charming sociabilities.

Yours sincerely,

Katherine Anne Porter

Katherine Anne Porter
College Park, Maryland

Congressional hit record

Note to pragmatic existentialists: No matter how whole your particular earth, there's always somebody in Washington wants to deal it away. Protect yourself with the Congressional Record. A bit windy but you'll learn how to read it with a little practice. And burns slowly with good heat for afteruse in the fireplace. Write your Congressman and Senators first, to see if they can add you to their comp list. If not: $3.75 per month, $45 per year, or 25 cents per copy, payable in advance. Check or money order payable to Superintendent of Documents, Government Printing Office, Washington, D.C. 20402. Well worth the investment.

– my
Union, Maine

Save Suwanose

We celebrated Suwanose island, south of Japan, with an account (CATALOG p. 179) by a visiting American communard, the very same Dean Fleming who did the cover of this CQ.

The tiny tropical volcano community is threatened by a ritzy development by Yamaha – whose guitars, pianos, motorcycles are thus worth boycotting in concert with an amazing coalition of American & Japanese poets and artists. Their wonderful book, Om, *costs $2 from 290-A Page St., San Francisco, CA 94102, or Japan address below.*

– SB

Om
Cosmic Child Community
1974; 102pp.
$2.00 postpaid
from:
Cosmic Child Community
Kokubunji Embassy
2-664 Nishi-koigakubo
Kokubunji, Tokyo 185,
Japan

Suwanose banyan tree of life

Nomadics

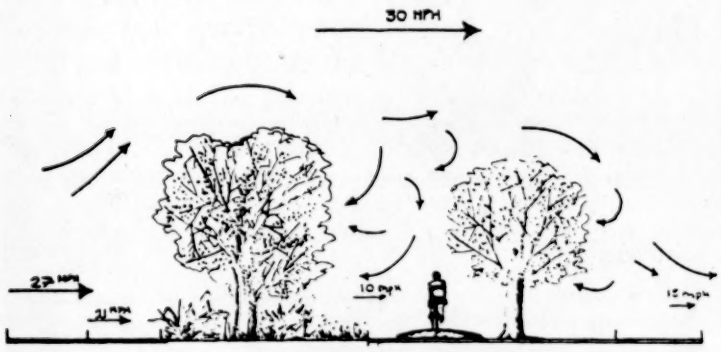
Bikeway Planning and Design

A brief summary of the factors that should be considered when planning bikeways and other bicycle-encouraging facilities. A more comprehensive book is coming up, but meanwhile this pamphlet can help cyclists (and those who plan for them) talk to officials who hold the money.

– J. Baldwin

Bikeway Planning and Design
A Primer
David A. Bainbridge and Michal C. Moore
1974; 9pp.

$1.00 postpaid
from:
David A. Bainbridge
57 Slatters Ct.
Davis, CA 95616



Windbreaks

Wind is a very significant factor in bikeway planning and design. Resistance increases dramatically with wind speed: at 10 MPH = 25% total, 25 MPH = 70%, 40 MPH = 85%. Thus in areas where 10-15 MPH winds are common design must attempt to reduce wind effects. Windbreaks can be very effective, see above.

CitiCar

This little machine is claimed to be the first high-production electric car. We've seen them around San Francisco, and the owners say they like them. The cars are well finished. They look "real". They combine a practical size with the other advantages of electric cars: silence, very low operating costs, simple mechanism, and instant starting (no warmup at all) in any weather. But to keep costs reasonable, the CitiCar is on an unsophisticated chassis, and the catalog conveniently forgets to include battery replacement costs, (between $200.00 and $300.00), in the cost of running. Batteries might last up to five years, but they commonly last much less in golf carts. The CitiCar comes in two versions – one with a 28 mph cruising speed (basic price $2590) and one with 35 mph ($2795). Both have a maximum range of 50 miles and my guess is that under most conditions you wouldn't get quite that far. Recharging takes overnight with the built-in charger. All things considered, the CitiCar seems to be a useful little car well suited to many urban tasks. There is plenty of competition shaping up too; it won't be alone for long.

– J. Baldwin

CitiCar
information from:
Sebring-Vanguard, Inc.
Box 1963
Sebring, FL 33870

Blue Hole Canoes

Kathleen and I have always wanted a white water canoe. Working one requires quite literally thinking together, and gives rise to a kind of closeness that we find beautiful. But up to now, we've not tried it. Canoes are expensive, and white water tends to bust fiberglas and wood, and crush aluminum (I totalled out a Grumman once in about 2 seconds). Recently we were in Tennessee and North Carolina, and we stopped by to see the Chattooga River where they made "Deliverance". We found people running canoes in water we would've thought twice about putting a commercial quality raft into! And the canoes weren't breaking up or squashing. They were Blue Hole Canoes. We talked to a lot of people about them, and also visited their tiny factory. Nice people, taking their time and doing a good job. In their spare time they run the local rivers in their own product. The Blue Hole is made of extra thick Royalex, a multi-layered sandwich of Vinyl and foam. It's resilient and remarkably energy absorbing. Gunwales are soft aluminum so they won't break when you beat out a dent. Really good hydrodynamics too. We bought one. We'll let you know if we survive.

– J. Baldwin

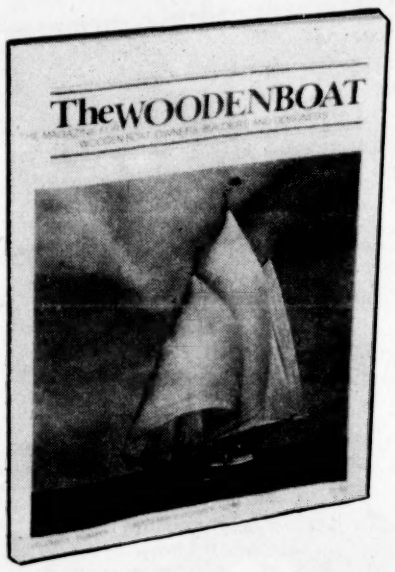
Blue Hole Canoes
$445.00 fob
from:
Blue Hole Canoes
Sunbright, TN 37872

The Wooden Boat

About the finest craft material is wood. About the finest thing you can do with wood is build boats – it's what cabinetworkers graduate to if they're good. This new magazine is well-crafted, home-published. Bless its heart, it reviews fine tools.

– SB
[suggested by Richard Shew]

The Wooden Boat
Jonathan Wilson, ed.
$9 yr. (bimonthly)
from:
The Wooden Boat
Box 241
Brooksville, ME 04617



It is true that a few quality hand tools are being imported from Europe, where such are still to be found to a limited extent, but the same processes of change are at work there as earlier altered the direction and content of American life, and the end of quality and craftsmanship in Europe also is in sight. Already the supply of quality hand tools has all but dried up in England, and the situation in Scandinavia is hardly more promising . . .

. . . One of the most pressing needs at this time is for heavy plane irons of the kind suitable for the many shapes and sizes of wooden planes which the builder of wooden boats requires, making the wooden stocks for the planes himself, as he needs them. Besides the many lengths of flat soled planes from smoothers to long jointers, there are backing-out planes, rocker planes, champher planes, rabbet planes, and spar planes. In the kit of the master boatbuilder there will often be found forty or more of these planes of various sizes and kinds, most of which he made himself, except for the blades or "irons." Other essential tools needed but practically unobtainable, are quality adzes, slicks, and caulking kits.

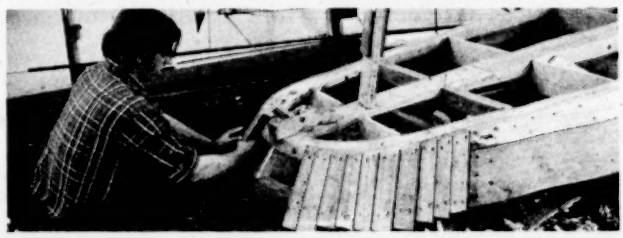
Sensible Cruising Designs

by L. Francis Herreshoff
International Marine Publishing Co.
Camden, Maine, 1973

Although L. Francis Herreshoff has now passed away, this book is surely one of his finest memorials. The introduction contains some of the last words written by the "dean of American yacht designers" prior to his hospitalization, and older readers will note that his mind was as clear and his pen as direct as it ever was. Lovers of wooden boats, especially, will regret that the introduction was necessarily halted where it was, for he was just beginning to point up the distinct advantages of well-built wooden yachts.

The greater part of the work is the collection of classic Herreshoff designs. Nine of these include the complete drawings, specifications and building instructions. They were the subjects of the author's series of "How to Build . . ." articles which appeared in "The Rudder" in the '40s and '50s. They range from the H-14 dinghy and double-paddle canoe to the 36' NEREIA and the larger MOBJACK and GOLDEN BALL. Included also are MEADOW LARK, ROZINANTE and the H-28 ketch, the designs which continue to grow ever more popular today. The specifications and instructions are practically a course in yacht building, and the text which accompanies the H-28 material is practically a cruising manual.

The second part of the book contains a selection of some 46 of Herreshoff's finest designs. Included are 2 canoes, a couple of daysailers, a small centerboard cruising sloop, the mighty TICONDEROGA and a couple of even larger 3-masted cruising auxiliaries.



Boatbuilder's Manual

One way to get on the river for less money is to make your own boat. But fiberglass is a tricky bit, and all too often ends up a gooey disaster or an inferior heavy boat. There have been manuals before, but they assume you have some experience, or they conveniently leave out the horrible parts so when you get there, there's no help in the book. Not so with this one. The clear thinking and thoughtfulness of the author comes through every time. Just as you're about to ask, he says "about now you'll be wondering" . . . . and then gives you what you need. This may be the best manual on anything I've ever seen. His information will be useful to those using fiberglas for other things than boats too. Exceptional.

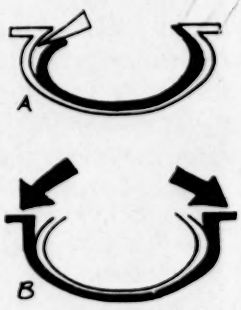
– J. Baldwin

Boatbuilder's Manual
(How to build fiberglass canoes and kayaks for whitewater)
Charles Walbridge
1973 (second edition); 68pp.

$4.50 postpaid
from:
Wildwater Designs
Penllyn, PA 19422
or Whole Earth

The procedure is as follows:

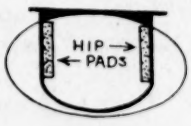
1) Unbolt the mould completely.
2) Using a screwdriver or some other strong tool, pry the flanges apart.
3) Using a wooden wedge (plastic is OK) pry the sides of the boat from the mould (A). A long, flexible Teflon wedge is useful for getting under a boat.
4) Strike the bottom of the mould with the flat of your hand. If it hurts, you've gone too far. No Karate chops, please.
5) Applying both downward and outward pressure(B) to the flanges, force the mould away from the boat. HINT: if powerful, show restraint.



OUTFITTING KAYAKS:

A kayakist holds himself inside his boat by pressing his knees against the deck. This pressure is maintained by wedging his feet against the foot braces. Back and lateral support are provided by the seat.

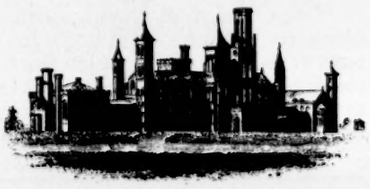
FITTING THE SEAT: Kayak seats only come in one size, but their sides should fit snugly against the boater's hips. If this is not the case, rolling and bracing may be difficult. Take Ethafoam and trim down a 4"x6" piece to the proper thickness. (PVC Foam or Neoprene works, too) Tape or glue in place.



Ted Streshinsky

October 1966, outside the Warehouse on Howard St., San Francisco — "Kesey for Governor", "Acid Test Graduation", Hermit fiddling around on top, where everyone eventually migrated. This is one of the Ted Streshinsky photographs that ran in gaudiest color with Tom Wolfe's original series of Acid Test articles in the Sunday New York **Herald-Tribune.**

"FURTHUR" to



It's becoming clear that the only way we'll ever get Kesey off the Bus is to snatch it away from him.

The Kesey in question is Ken Kesey, author of **One Flew Over The Cuckoo's Nest, Sometimes a Great Notion,** *and* **Kesey's Garage Sale** *(all Viking). Also progenitor of the Merry Pranksters, the Acid Tests, the 1960's da-glo renaissance, peace with the Hell's Angels in our time, and numerous additions to the language — "fantasy", "bumtrip", "your movie", etc. Kesey is the hero of Tom Wolfe's non-fiction novel* **The Electric Kool-Aid Acid Test.**

Kesey's Bus was the first (1964) of an eventual American armada of travelling hippy-commune school buses. Its name was "Further" — so named by Prankster Roy Sebern in response to the question, "What is the destination of this bus?" For years it was spelled "Furthur", like "Arthur".

The Bus was a sight to behold and keep beholding. The painting, welding, furbishing and refurbishing never stopped. Mottoes, daymares, clippings, collages, bunkbeds, rugs, domelights, decks, balconies, sound systems — layer after layer like some meta-grotesque pearl. Archaeologists may find in its strata as many arcane messages as the Great Pyramid.

I was around for some of all that. Enough to realize that the Bus is a true and unusual artifact of a true and unusual time in American grassroots history. So I wrote the following letter to The Smithsonian, a wonderful museum fondly regarded by all as the nation's attic.

Director Hindle responded, "Although this is a dimension of cultural history with which this Museum must come to grips, I must confess I had never heard of the Bus."

I suppose if enough others write to the Smithsonian gently urging the acquisition, that one day soon an official letter will come to Kesey's farm in Pleasant Hill, Oregon. "Dear Further, Greetings . . ."

— SB

Dr. Brook Hindle, Director
National Museum of History and Technology
Smithsonian Institution
Washington, DC 20560

Dear Dr. Hindle:

Dr. Washburn informs me (July 17 phone call) that this matter requires your personal attention.

If the "Psychedelic Sixties" is ever deemed a phenomenon worth recalling formally, there's no more central artifact than the Bus called "FURTHER" which was the travelling headquarters of Ken Kesey and the Merry Pranksters.

Much of the story of the Bus may be found in Tom Wolfe's **The Electric Kool-Aid Acid Test.** I'm enclosing an account of one minor Bus adventure that I published in **The Last Whole Earth Catalog.** *["The Great Bus Race", p. 245.]*

The travels of the Bus are recorded on miles of (unreleased) tape and 16mm color film. Among the treasures are blazing monologues by driver Neal Cassady – the closest thing to a Muse the Beat Generation ever had; Countless American streets of startled citizens waving and smiling at the giddy strangeness roaring past; sundry foundings of a subculture's beliefs, such as "You're either on the Bus or off the Bus."

The Bus itself lives in retirement behind the sheep pen at Ken Kesey's farm in Oregon. Not too many more Oregon winters will reduce it to unrecognizable rust. If the Smithsonian were to rescue it now, FURTHER could rise to one last memorable journey across its continent.

I've researched a museum exhibit for Gordon Ashby ("Astronomia" at the Hayden Planetarium in NY), written a chapter in the forthcoming handbook of North American Indians ("Indians and the Counter-Culture"), and once had to turn down an invitation (from your Dr. Sturtevant) to prepare an exhibit on the Native American Church. I believe that, with the Bus, you would have a vehicle as historic as "The Enola Gay" – with a far eagerer audience, then, now, and to come.

Ken Kesey's address and telephone are: *[deleted]*

Stewart Brand

The Smithsonian

October 1966, inside the Warehouse

"The thing is, Ken" – he has an English accent, but it is a middle-class accent, a pleasant sort of Midlands accent – "the thing is, Ken, a lot of people are very concerned about what you've said, or what the newspapers say you've said, about graduating from acid. A lot of people look up to you, Ken, you're one of the heroes of the psychedelic movement" – he has a kind of Midlands England way of breaking up long words into syllables, psy-che-delic move-ment – "and they want to know what you mean. A very beautiful thing is happening in Haight-Ashbury, Ken. A lot of people are opening the doors in their minds for the first time, but people like you have to help them. There are only two directions we can go, Ken. We can isolate ourselves in a monastery or we can organize a religion, along the lines of the League for Spiritual Discovery" – the League for Spi-ri-tu-al Dis-cov-ery – "and have acid and grass legalized as sacraments, so we won't have to spend every day in fear waiting for the knock on the door."

"It can be worse to take it as a sacrament," Kesey says.

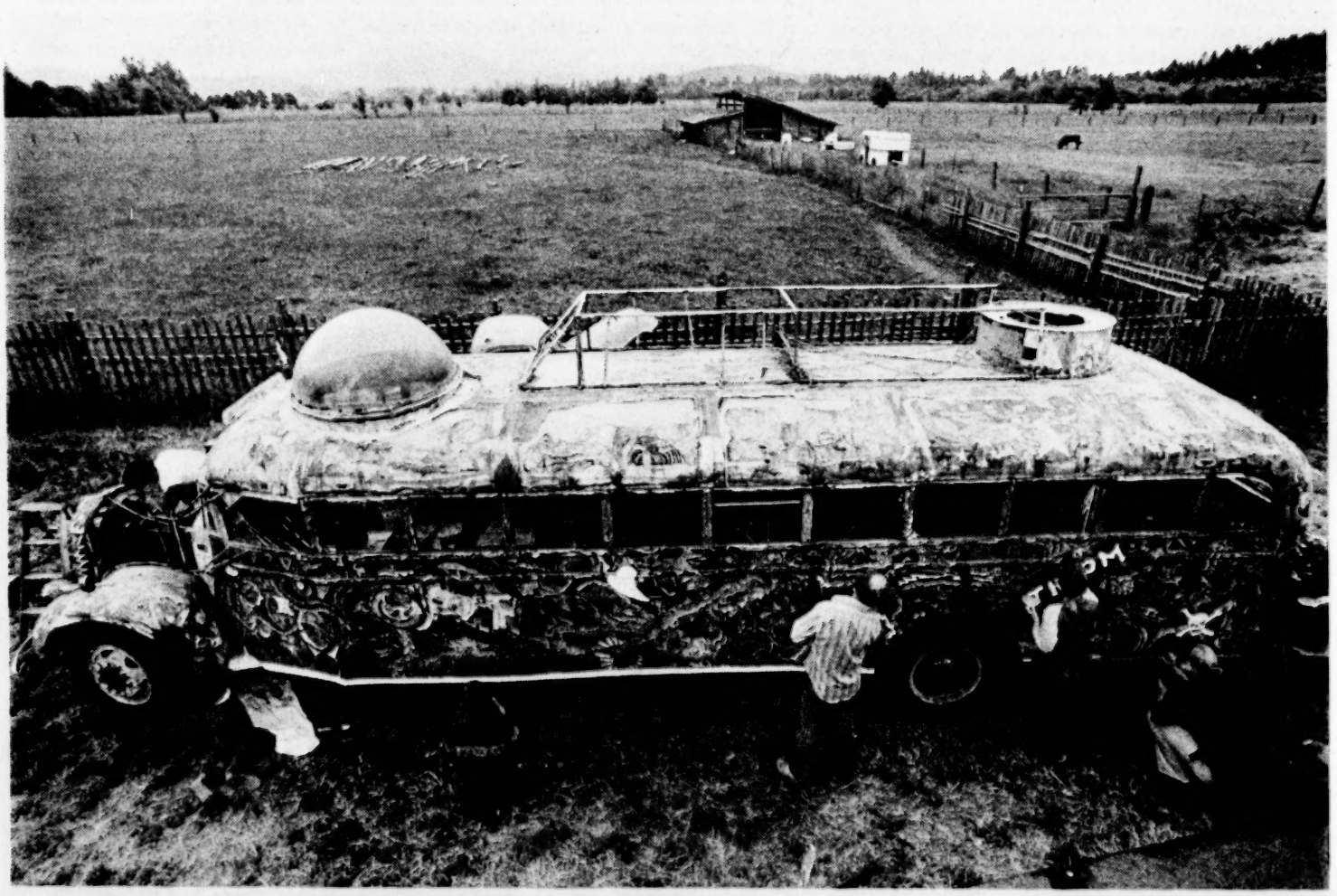
– The Electric Kool-Aid Acid Test

Ted Streshinsky

SB

June 1969, Aspen Meadows, New Mexico

Feverish last minute preparations aboard Further just before The Great Bus Race. After the usual amount of acid-laced death defiance — it was a cross-country mountainside course — the Hog Farm's Kitchen Bus (or was it Road Hog?) defeated Further and took her silver bell. Four other buses also ran.



Annie Leibovitz

October 1974, Kesey's farm, Pleasant Hill, Oregon

Kesey (bald spot & stripes) and friends add a fresh coat of lightning and stars in case Further's country calls. ■

Parachuting

Sport parachuting has become a well organized, well recognized aviation activity since catching on some 15 years ago. More than 20,000 skydivers take to the air each weekend over the U.S. After leaving a perfectly good airplane, the jumper accelerates for eleven seconds until he reaches some 120 mph and "terminal velocity": that speed at which his weight equals his wind resistance. By standing on his head and reducing his frontal area to the air, he can get up to about 190 mph. It is in this way of altering the body's flying attitude that a long line of fast exiting skydivers can end up on the same level to join hands in a circle or "star". The next challenge is entering and flying the star without breaking it up; its easy to transform the delicately balanced star into a comical human waterfall. The most common jump altitude is 7,500 feet for a 30 second "delay" or freefall until its time to pull the ripcord. Falling flat and stable at terminal burns up about 1,000 feet in five seconds and one always pulls the ripcord at 2,500 feet. If the main chute should fail, one now has ten seconds to pull the reserve.

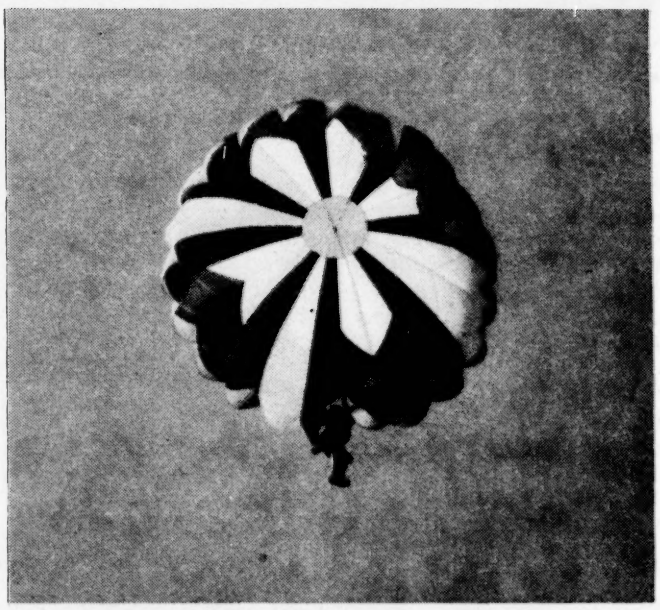
The ride down under the large colorful nylon canopy takes about two minutes and it can be steered to land most anywhere you like. The view is incredible and there is no noise as you descend slowly over the countryside. Landings are like hopping off a cable car, or if you're not from San Francisco, like jumping off the hood of a car moving slowly at 3 to 5 mph. Not hard but tricky because of the horizontal movement produced by the wind and forward motion of the canopy. Parachuting isn't as rough and tumble as its Army Airborne heritage would lead you to believe. In the U.S., 13% of the skydivers are women and this percentage is on the increase. Yes, anyone can fall.

Students undergo a thorough half day training session to acquaint them with the equipment, the exit procedure, canopy steering, landings and emergency procedures. The first jump course runs about $45. at most clubs and centers. After this initial jump, aircraft rides cost $3. to $5. plus equipment rental; like skiing, its cheaper when you own your own gear. The first five jumps are on a "static line" which activates the parachute automatically. From there the student goes to short delays and progresses to longer ones from higher and higher altitudes.

For more information on sport parachuting and the name of the jump activity nearest you, write:

United States Parachute Assn.
P.O. Box 109
Monterey, CA 93940
Attn: M & D Dept.

Canadian Sport Parachuting Assn.
Burlington, Ontario
L7R 3Y7 Canada
Attn: M & D Dept.



For a good book of basic instruction covering all aspects of skydiving, get:

Sport Parachuting
Russ Gunby
1969; 162pp.
$3.95 postpaid

from:
Strong Enterprises, Inc.
542 E. Squantum #15p
North Quincy, MA 02171

There are some 500 parachute centers across North America and the jumping everywhere is under the control of about 300 Area Safety Officers appointed by the national organizations. Jumpmasters and instructors are licensed by the USPA and CSPA after undergoing rigorous training and testing sessions. Parachutists may pack their own main parachutes but mains to be used by others and all reserve parachutes must be packed only by Federally licensed parachute riggers.

Freefall parachuting is the closest man has come to pure flight.

— Dan Poynter
Santa Barbara

Dan Poynter is author of **Hang Gliding** *(EPILOG p. 645). He has made some 1200 parachute jumps. I've made 27. Parachuting can give you new relationships to: release, body, air, companions, hazard, death, and pride.*

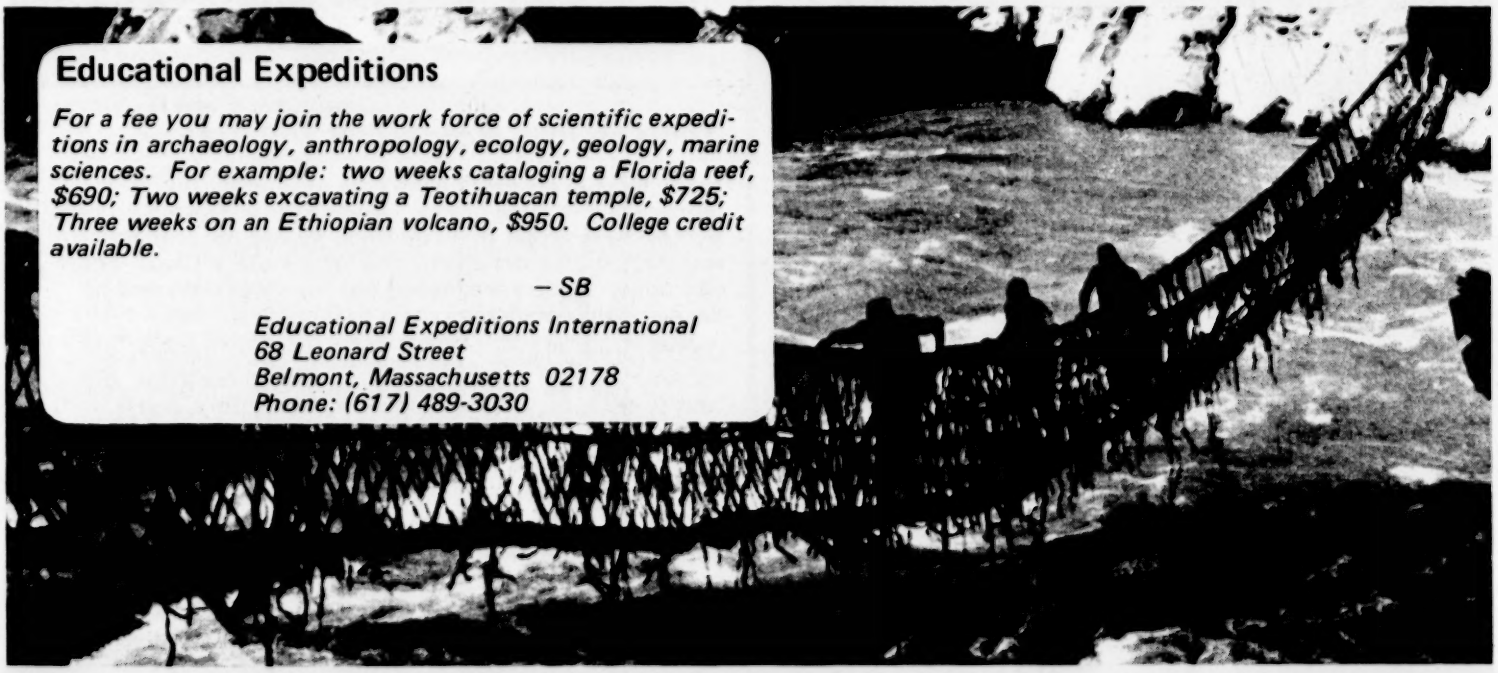
— SB

Educational Expeditions

For a fee you may join the work force of scientific expeditions in archaeology, anthropology, ecology, geology, marine sciences. For example: two weeks cataloging a Florida reef, $690; Two weeks excavating a Teotihuacan temple, $725; Three weeks on an Ethiopian volcano, $950. College credit available.

— SB

Educational Expeditions International
68 Leonard Street
Belmont, Massachusetts 02178
Phone: (617) 489-3030

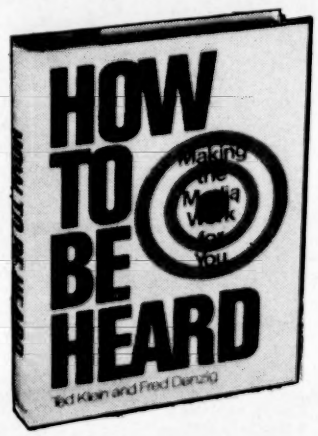


Communications

How to Be Heard

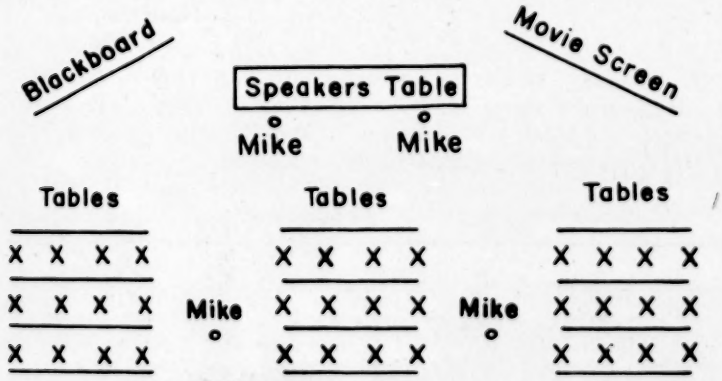
A must for anyone who ever needs to use or deal with publicity. Provides an x-ray view of the making of the news, preaches a sound ethic (be well prepared) for dealing with its purveyors; lists resources for cranking up an effective movement. Pithy, handily indexed, and full of tidbits about situations where Davids trounced Goliaths by doing their homework.

— Stephanie Mills

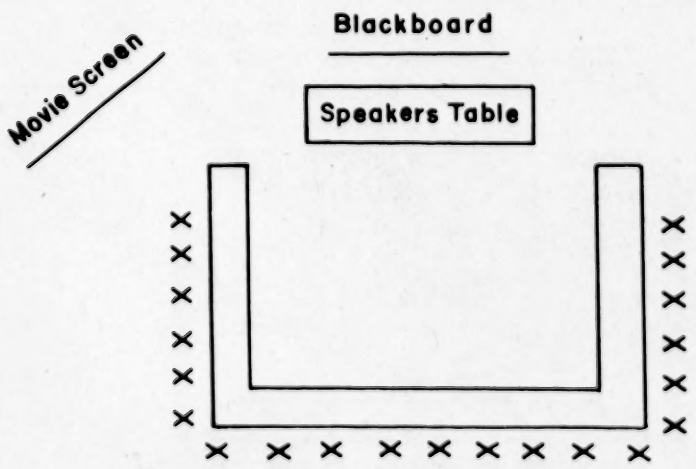


How to Be Heard
(Making the Media Work for You)
Ted Klein & Fred Danzig
1974; 346pp.
$9.95 postpaid
from:
Macmillan Publishing Co., Inc.
Order Dept.
Front & Brown Streets
Riverside, NJ 08075
or Whole Earth

The papers that you deal with will be more receptive to your stories if you supply useful information in complete form. Your press release should include a name, address, and telephone number for the reporter's follow-up questions. If possible, provide alternate names and numbers. If the contact named on your release is not able to be at that number for periods of time, arrange to have another person receive the call and supply information, or find out the needed information and relay it to the reporter. Promptly. Reporters who are racing deadlines — and you must assume that they *always* are racing deadlines — do not like to be told that the person listed as the contact isn't around and won't be back for a few hours or will call back tomorrow.



Room setup for 30-50 reporters

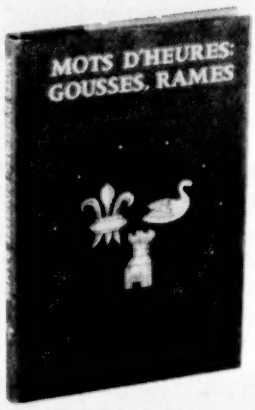


Room setup for 15-20 reporters

Mots d'Heures: Gousses, Rames

Far beyond fractured French is the multi-dimensional bilingual punwork of this party favor. Frenchmen HATE it. All others revel. Try "Hickory dickory dock", below.

—SB
[suggested by Gregory Bateson]



Mots d'Heures: Gousses, Rames
(The d'Antin Manuscript)
Luis d'Antin Van Rooten
1967; 48pp.
$3.95 postpaid
from:
Grossman Publishers
625 Madison Avenue
New York, NY 10022
or Whole Earth

Et qui rit des curés d'Oc?[1]
De Meuse raines,[2] *houp! de cloques.*[3]
De quelles loques ce turque coin.[4]
Et ne d'ânes ni rennes,
Écuries des curés d'Oc.[5]

---

[1] Oc (or Languedoc), ancient region of France, with its capital at Toulouse. Its monks and curates were, it seems, a singularly humble and holy group. This little poem is a graceful tribute to their virtues.

[2] Meuse, or Maas, River, 560 miles long, traversing France, Belgium, and the Netherlands; Raines, old French word for frogs (from the L., *ranae*). Here is a beautiful example of Gothic imagery: He who laughs at the curés of Oc will have frogs leap at him from the Meuse river and

[3] infect him with a scrofulous disease! This is particularly interesting when we consider the widespread superstition in America that frogs and toads cause warts.

[4] "Turkish corners" were introduced into Western Europe by returning Crusaders, among other luxuries and refinements of Oriental living. Our good monks made a concession to the fashion, but N.B. their Turkish corner was made of rags! This affectation of interior decorating had a widespread revival in the U.S.A. at the turn of the century. Ah, the Tsar's bazaars' bizarre beaux-arts.

[5] So strict were the monks that they didn't even indulge themselves in their arduous travels. No fancy mules nor reindeer in *their* stables. They just rode around on their plain French asses.

Tools on loan from public libraries

More libraries are getting into the tool rental business: patrons of the three-branch Grosse Pointe, Michigan, Library System have access to a 200-item, $9000 tool collection that was started 30 years ago by the local Rotary Club. Tools like power sanders are loaned out for three days and no deposit fee is required.

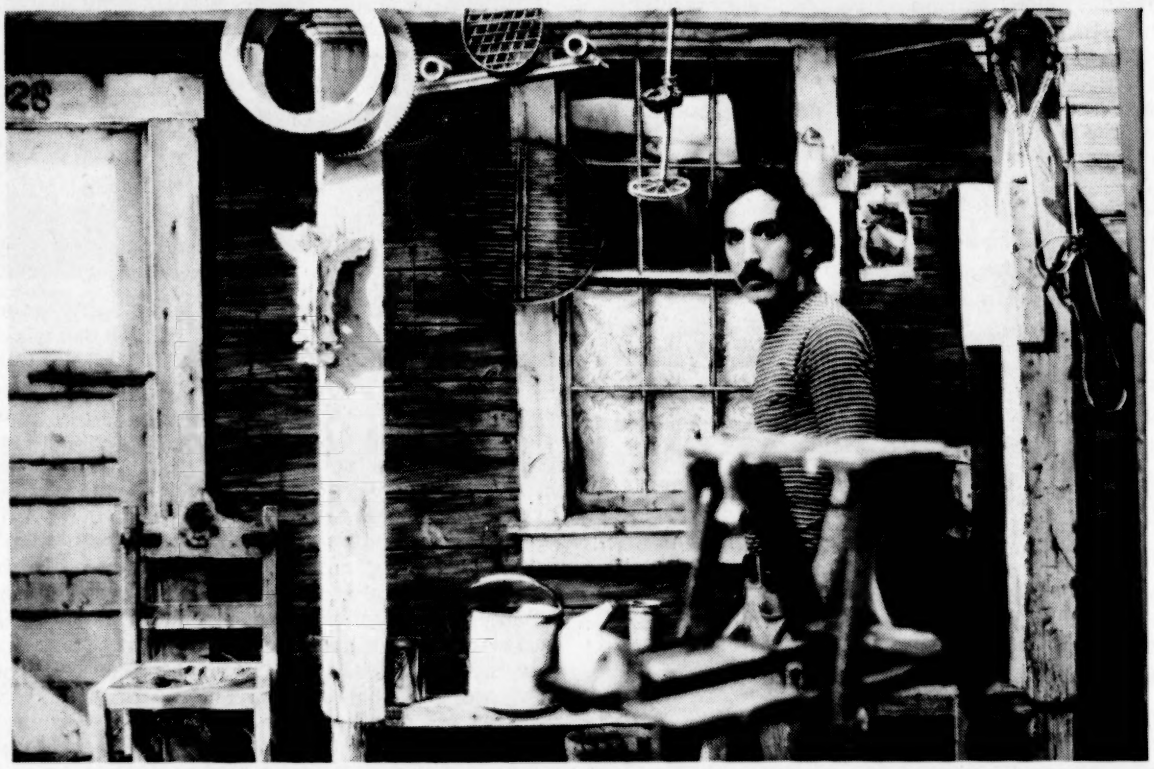
Ohio's Canal Fulton Public Library has a collection that includes an auto tune-up kit, slide rule, microscope, guitar, four cassette players, several movie projectors, and a ventriloquist's dummy.

The Plainedge, New York, Public Library is loaning out pocket electronic calculators, rototillers, dwell meters, strobe lights, tree pruners, aluminum extension ladders, hedge trimmers, saber saws, belt sanders, and electric sewing machines.

Reports indicate that most patrons take care of equipment, though some losses and damages have occurred.

(Reprinted from **Library Journal**, *December 1974)*

Identify Three Real Objects in this photograph . . .



Answer: 1) stepladder, 2) person, and 3) painting. That's Paul Sarkisian and a life-size photo-realist work of his at the Oakland Museum. Sent to us by Peter Bailey.

Birdman of Los Angeles

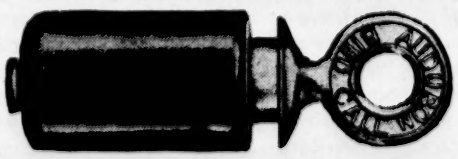
Dear W.E.E.:

This one you cannot pass up. This is the best damn $2 I ever spent. The Audubon Bird Call works. It won't do ducks or crows or turkeys — but it will do every song bird I've come across. I am not a bird fan (i.e., watcher, listener) in the classic sense. I'm a composer and sound freak. That's why I bought this thing in the first place. For $2 it was cheaper and more efficient than a Buchla synthesizer — my 2nd favorite source of bird simulations. I bought it sound unheard but it was a gem. In the middle of one night there was a wiseacre bird outside my house singing like crazy. I got out my trusty Audubon Bird Call and matched this bird, note for note, phrase for phrase for over an hour and neither of us ever repeated a phrase. I would answer him unless he stopped. Then I would lead off with something I thought idiomatic and he always jumped back in. I still don't know what kind of bird it was and really don't care. But I really talked to that bird and learned his sense for variation and development in his singing. It was tremendous.

Now the thing takes a little practice and a musical ear is clearly an asset; but it is the simplest musical instrument I ever played and probably the most versatile and pregnant. I used the thing for a movie soundtrack (for background) in a film I was scoring and it was perfect. Talk about absolute control!

If you have a passing interest in birds (as I do) or more, you'll love this thing — take it on hikes, picnics, whatever. If you hate birds — this may be the key to telling them to buzz off in language they'll understand — no shit. It now costs $2.50 from Roger Eddy, Newington, CT 06111 — still a real deal.

— Roger Hyde
Los Angeles, California



Color Primer I & II

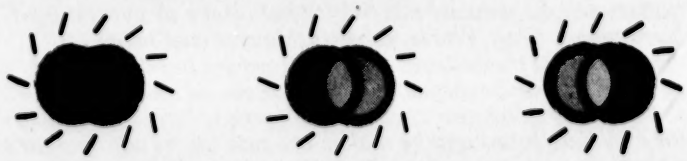
A wonderfully simple, wonderfully graphic guide to understanding and manipulating colored light and colored pigment.

— *SB*
[suggested by Sarah Fisk]

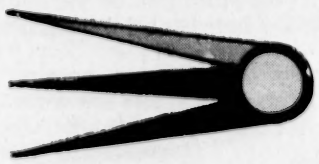
Color Primer I & II
Richard D. Zakia and
Hollis N. Todd
1974
$5.95 postpaid
from:
Morgan & Morgan, Inc.
Publishers
145 Palisade Street
Dobbs Ferry, NY 10522
or Whole Earth

We have learned that:

1. The addition of two of the red, green and blue primaries of white light will produce colors having cyan, magenta and yellow hues.



2. The addition of equal amounts of all three primaries of white light will produce neutrals.



What is your relationship to television?

Here we have a short questionnaire on people's relationship to tv-watching. The results will be published here in the CQ (Summer) and may also appear in a book I am currently writing about television, to be published by William Morrow & Co. next year. I'll tell you a little more about the book below.

— Jerry Mander

1. **Do you watch tv?** _____
2. **About how many hours do you watch in an average week?** _____
3. **Do you feel this is too much or too little?** _____
4. **When you watch, do you take whatever comes, or do you select programs?** _____
5. **Are there times when you find yourself thinking about tv, or planning your watching?** _____ **When are those times?** _____
6. **Do you have kids?** _____
7. **How much do they watch?** _____
8. **Do you attempt to control their choices, as to programs, or quantity?** _____
9. **How do you feel about their relationship to tv?** _____ _____
10. **Are you trying in any way to change your own relationship to your television habit?** _____ **More?** _____ **Less?** _____
11. **How are you going about this?** _____ _____
12. **Are you succeeding?** _____
13. **If you watching more television than you used to, why are you?** _____
14. **What do you feel you've given up to do this?** _____ _____ **What have you gained?** _____
15. **If you watch less television than you used to, why?** _____ _____ **What are you replacing it with?** _____ **What have you lost?** _____
16. **Remarks or amplifications?** _____ _____ _____

Name (optional) _____
Address (optional) _____

(Rather than cut this out, just reply by question number on separate paper, and SEND TO: Jerry Mander, The CQ, *Box 428, Sausalito, CA 94965.)*

As you can probably tell, this is not a tightly scientific survey. I am merely trying to get at how people use television, and how they feel about the way they use it. You might be able to put it all in a few words, far better than those questions, and if you want to do that please do. Frankly, my own operating assumption is that while television viewing in the U.S. is growing at an incredible rate (some figures I've seen put the average family in front of the set nearly seven hours daily), nonetheless, most people don't seem to feel good about their habit. I have seldom met anyone personally who feels that he or she watches too little. So the whole thing begins to feel like your classical addiction problem. (Addiction, by me, is when you find yourself doing a thing more than you wish to, and even after you've noticed it, you still keep doing it.) The television experience seems to have become a substitute for otherwise available experiences, and more and more people say they use it to "space out." But "out" from what? And with what results? The book looks at the personal consequences of the choice, and also the social and political forms that seem to develop from it, and stimulate it. The tv-viewing experience has certain definable attributes: it shows life's experience away from the sensual, instinctive, feeling and "knowing" modes, and directs it toward the "objective" cerebral modes. (You get descriptions of swamps; you don't get swamps.) Is seven hours daily of this experiential-perceptual change producing any mutations out there? I think so. TV also takes our minds from where we are to where the people at the other end of the media-tunnel wish us to be. Life is less in our own hands; more and more it happens where we are not. We become the tape recorder of distant images; but what's happening on the block? The book is about the meaning of such questions as those, both personally and politically, and it offers some alternatives. Among them are specific techniques for unplugging yourself from your set, and therefore the above questionnaire. If the results are interesting, I'll try to keep up some kind of dialogue in these pages. And if you send me your name and address, I'll also try to keep you in touch personally. Thank you.

— JM

Health & Light

Dr. John Ott studies the effects of changes in light intensity and spectra on plants and animals, including humans; his report is both scary and "enlightening."

Post-Edison generations (only five), through indoor lifestyles, smog, sunglasses, etc., have sharply and suddenly (in evolutionary terms) reduced our traditional intake of natural light (sun, moon, fire). Worse, substituting artificial light — incandescent, fluorescent, tv, et al — we get big doses from parts of the electromagnetic spectrum our retinal-pituitary-endocrine systems can't handle. Ott calls it "malillumination" (like malnutrition) and he makes the case for its connection to disease and disorientation. Some light is worse than others; get rid of pink fluorescent now. And no sunglasses. On the other hand, in this natural-light-starved culture, certain lights may cure. Ott will help you think on yet another techno-industrial intermediary between your body and one of its (energy) foods.

— Jerry Mander
[suggested by Steve Baer]

Health & Light
(The effects of natural and artificial light on man and other living things)
John N. Ott
1973; 208pp.

$7.50 postpaid
from:
The Devin-Adair Company
One Park Avenue
Old Greenwich, CT 06870
or Whole Earth

In breeding lab animals it is still procedure to remove the male from the cage before the birth of the litter because of his tendency toward cannibalism. However, the male rats in cages exposed to sunlight were observed to help care for the litter, especially when the female rat was removed from the cage . . . furthermore the adult male rats appeared more docile and friendly when handled, whereas those kept under fluorescent light showed irritation and a tendency to bite.

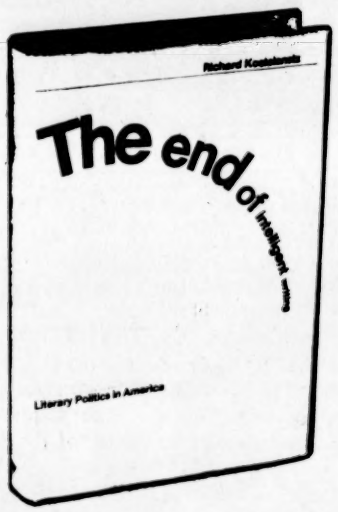
•

The practice of administering behavioral modification drugs, or "peace pills," as they have sometimes been called, to grade school children has caused much controversy and concern, not only on the part of parents but also among many congressmen, government officials and physicians. This hyperactivity problem may well be the result of exposure to radiation from television sets, to which children are particularly susceptible.

The End of Intelligent Writing

Kostelanetz is Upton Sinclair to the Literary-Industrial complex, but better. His book is opulent, unabashedly intellectual, cranky and perceptive. It documents the monopolization of American publishing and literary taste by a smallish coterie of aging New Yorkers. High points are gossip about the aforementioned literary mob; analysis of the way conglomeration has eroded publishing's cultural mission; and tantalizing mention of numerous young writers languishing in relative obscurity, a species endangered by PR monocropping. Tool-wise, this book may be some comfort to the frustrated finewriter — you were not paranoiac, the deck was really stacked. Kostelanetz calls for alternative publishing, more modest and specific outlets. The ball is back in the people's court.

— Stephanie Mills



The End of Intelligent Writing
Literary Politics in America
Richard Kostelanetz
1974; 480pp.
$12.95 postpaid
from:
Sheed and Ward, Inc.
475 Fifth Avenue
New York, NY 10017
or Whole Earth

The average "shelf life" for a mass paperback is 11½ days — much like a fresh vegetable in a grocery store; and more than half of the paperback books in America are, in an epitome of atrocious waste, squashed, unread, back into pulp simply because they are cheaper to destroy than return.

•

In the end, however, most of the new owners were more troublesome than beneficial. Some insisted upon moving the publisher's offices into high-rent midtown Manhattan skyscrapers, which not only increased the operating overhead but usually produced a less congenial working atmosphere. Employees were shifted around in counter-productive ways, while the bureaucracies burgeoned with Parkinsonian perversity. The inevitable breakdowns in communication and coordination were customarily blamed, should the author complain, upon "organizational kinks."

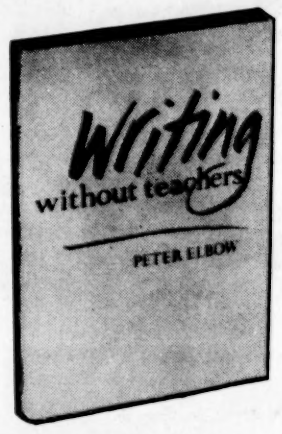
•

The conglomerate's financial department often raised the official "break-even point," which is the much-cited convenient fiction for the minimal number of copies a book must sell before becoming profitable (and thus a debating point in editorial meetings), even though this new higher sales figure had less to do with explicit production expenses than the reallocation of increased overhead. Whereas a hardcover editor once had to promise minimum sales of 3,000 copies, he now had to justify the expectation of 10,000, if not more; and if a mass paperback could once think in terms of 40,000 for a quality project, now nothing less than a projected buyership of 100,000 could convince the ultimate decision-makers. The money men also raised the minimum annual sales requirement, that is the number of books that must be sold each year to keep a published title currently in print — about a thousand in hardback, 40,000 in mass paperback; otherwise the book would be remaindered or sold for pulp. Since these decisions were made by computer, classics were cut along with trash. Victor S. Navasky writes that one Macmillan computer "declared all of Yeats out of print, because his books weren't selling enough copies per annum, until some clerk in the billing department recognized the name and brought it to somebody's attention."

Writing Without Teachers

According to Elbow, writing is sculpted from a rocky mass that you've generated freely, rather than wrought from an agony of cerebral ozone. His advice on how ranges from the specific to the sublime. Read the book literally — you'll write. Then read "writing" as a metaphor and just enjoy his wisdom.

— Stephanie Mills
[suggested by Jim Moore]



Writing Without Teachers
Peter Elbow
1973; 196pp.
$1.50 postpaid
from:
Oxford University Press
16-00 Pollitt Drive
Fair Lawn, NJ 07410
or Whole Earth

Another reason for starting writing and keeping writing: If you stop too much and worry and correct and edit, you'll invest yourself too much in these words on the page. You'll care too much about them; you'll make some phrases you really love; you won't be able to throw them away. But you *should* throw lots away because by the end you'll have a different focus or angle on what you are writing, if not a whole new subject. To keep these earlier words would ruin your final product. It's like scaffolding. There is no shortcut by which you can avoid buildint it, even though it can't be part of your final building. It's like the famous recipe for sturgeon: soak it in vinegar, nail it to a two-inch plank, put it in a slow oven for three days, take it out, throw away the fish, and eat the plank.

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The essence of editing is *easy come easy go.* Unless you can really say to yourself, "What the hell. There's plenty more where that came from, let's throw it away," you can't really edit. You have to be a big spender. Not tightass.

•

Iago's work is almost done once he gets Othello to the point of needing certainty: only one answer is acceptable — infidelity. Fidelity is incapable of being determined with certainty. The need for certainty, then, tends to carry in itself a drift toward certain kinds of investigations and certain kinds of results. There are some kinds of data and propositions and insights a person cannot benefit from if he has no tolerance for working with uncertainty.

•

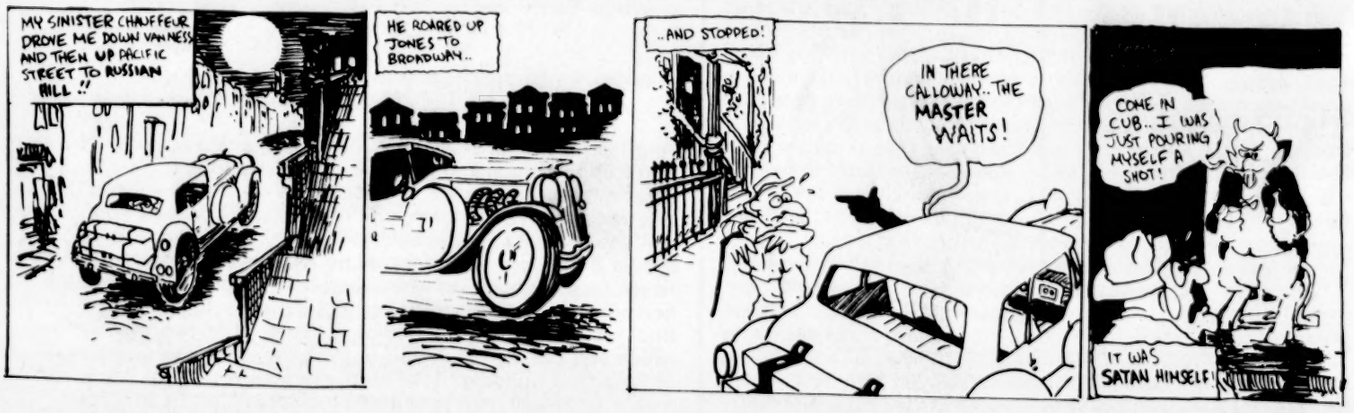
Trying to get the beginning just right is a formula for failure — and probably a secret tactic to make yourself give up writing.

•

It is a class of seven to twelve people. It meets at least once a week. Everyone reads everyone else's writing. Everyone tries to give each writer a sense of how his words were experienced. The goal is for the writer to come as close as possible to being able to see and experience his own words *through* seven or more people. That's all.

SOUTH OF THE SLOT
WITH CUB CALLOWAY, ACE REPORTER
PRESS!
TONITE'S EPISODE
THERE'S A HOT TIME IN THE OLD TOWN TONITE...

IT HAD BEEN A FEROCIOUS DAY.. I WAS EXHAUSTED.. I PASSED OUT AS SOON AS I GOT HOME..
zzz
..SUDDENLY I WAS WIDE AWAKE AND STANDING AT THE CORNER OF FILLMORE AND WEBSTER..
FILLMORE
WEBSTER
A LARGE TOURING CAR WAS PARKED NEXT TO THE CURB.. AND A VOICE ISSUED FROM WITHIN..
CUB CALLOWAY.. ACE REPORTER.. GET IN THE CAR.. THIS IS NOT A DREAM..
SOMETIMES A GOOD REPORTER DOES WHAT HE IS TOLD.. ESPECIALLY WHEN TERRIFIED!


MY SINISTER CHAUFFEUR DROVE ME DOWN VAN NESS AND THEN UP PACIFIC STREET TO RUSSIAN HILL !!
HE ROARED UP JONES TO BROADWAY..
..AND STOPPED!
IN THERE CALLOWAY.. THE MASTER WAITS!
COME IN CUB.. I WAS JUST POURING MYSELF A SHOT!
IT WAS SATAN HIMSELF!

COME IN, CUB! WE HAVE MUCH TO DISCOURSE UPON..
I'LL DRINK WITH YOU, NICK.. BUT YOU CAN'T HAVE MY SOUL..
CUB.. BE LOGICAL.. DO I NEED A REPORTER'S SOUL..
WHEN I OWN THE PUBLISHER..
SAY.. I'LL DRINK TO THAT!!
YESSSSS?
WHAT WILL YOU HAVE, SIRRRR?
UH.. YOU GOT ANY BEER. YOUR EVILNESS.?
THAT'S WHAT I LIKE ABOUT YOU, CUB.. LOTS OF CLASS..

WE BOTTLE THIS OURSELVESSS
IF YOU DON'T MIND A PUN, WE CALL IT..
.. DEVIL'S BREW..?
YOU TOOK THE WORDS RIGHT OUT OF MY MOUTH..
..I ALWAY WAS A FAST THINKER..
YESSS
..WHICH IS EXACTLY WHY I SENT FOR YOU.. I NEED YOU TO INTERVIEW ME..
.. SOUNDS GOOD..
..BUT I'M JUST A REPORTER.. WHY DON'T YOU HAVE THE PUBLISHER INTERVIEW YOU..?
COME ON, CUB!! DON'T BE NAIVE! NOBODY TRUSTS A PUBLISHER..

SOUTH OF THE SLOT
WITH CUB CALLOWAY, ACE REPORTER
TONITE'S EPISODE
THERE'S A HOT TIME IN THE OLD TOWN TONITE..
O.K. YOUR NASTINESS.. YOU ARE NOW BEING INTERVIEWED BY CUB CALLOWAY ACE REPORTER..
GOOD!! ..NOW MY FIRST ANSWER IS..
WAIT A MINUTE, JACK! I HAVEN'T ASKED THE FIRST QUESTION YET!!
..THERE IS NO SUCH THING AS FREE WILL..
WE'LL GET TO THAT LATER.. RIGHT NOW DESCRIBE YOURSELF. I'M SURE YOUR MANY FANS ARE INTERESTED..
WELL.. I AM RATHER FOND OF SAUL ALINSKY'S DESCRIPTION OF ME..
WHICH IS..?
..AS THE FIRST PERSONAGE TO DO BATTLE AGAINST THE ESTABLISHMENT AND WIN A KINGDOM.. I AM THE FIRST REVOLUTIONARY..
O.K.. YOU'RE A HERO TO THE TEENY BOPPERS.. SECOND QUESTION.. WHAT'S THE PURPOSE OF THIS INTERVIEW..?
CUB.. WHEN THE OPPRESSOR IS OVERTHROWN BY THE REVOLUTION.. WHAT HAPPENS TO THE REVOLUTIONARY..?
..OR TRY THIS ONE.. IF SOMEONE BEATS YOU EVERY DAY.. AND THEN ONE DAY.. YOU FIND THEM WITH THEIR BACK TURNED..?
YOU BEAT THEM, RIGHT! YOU'RE A CONDITIONED RESPONSE..
YOU MEAN.. THE KING IS DEAD.. LONG LIVE THE KING?
DO YOU KNOW I'VE BEEN DOING NOTHING BUT EVIL FOR A MILLION YEARS? DO YOU KNOW HOW BORING THAT IS..?
HMMM.. SATAN BORED.. THAT KIND OF NEWS WILL SINK THE STOCK MARKET.. WE WERE SORT OF HOPING FOR A GOOD WAR.. NICE VIEW..
CUB.. IF YOU KNOW A WAY TO MAKE ETERNITY LESS BORING FOR ME, YOU CAN HAVE ALL THE WARS YOU WANT..
..LIFE WOULD BE DULL FOR A REPORTER IF YOU WENT OUT OF BUSINESS.. NO ONE WOULD READ US! ..GAD.. THINK OF THE HEADLINES..
★ GARDEN CLUB MEETS TUESDAY **
ICK!
TELL ME, NICK.. IN THE MANY CONTESTS YOU'VE HAD WITH US HUMANS.. HAVE YOU EVER NOT CHEATED..?
NO.. I'VE LOST A FEW ROUNDS.. BUT I ALWAYS CHEATED!!
THERE'S THE ANSWER..
YOU'RE FED UP WITH UNEQUAL CONTESTS.. YOU HAVEN'T HAD A GOOD BRAWL IN EONS!
BY GEORGE, YOU'RE RIGHT!
POUR THE DRINKS WEIRDO..
YESSSS SIRRRR
YOU AND I WILL HAVE A CONTEST..
..BUT IT WOULD BE UNFAIR..
NOT IF YOU ACCEPT A HANDICAPP!
NO CHEATING?
NOT ONLY IS CHEATING OUT.. BUT YOU CONFINE YOURSELF TO MERE MORTAL ABILITIES.. NO SUPERNATURAL JAZZ..
..HOW INTERESTING.. LET'S DO IT!! MINION! GET THE PLANE..
YESS MASTER.. RIGHT AWAY..
WE'RE GOING UP IN THAT?
YOU SAID NO SUPERNATURAL JAZZ.. AND IT'S QUICKER TO FLY TO NEVADA COUNTY..
AWK! ARE YOU SURE YOU KNOW HOW TO FLY..?
I'M AN ANGEL, AREN'T I..?

SOUTH OF THE SLOT

WITH CUB CALLOWAY, ACE REPORTER

TONITE'S EPISODE

THERE'S A HOT TIME IN THE OLD TOWN TONITE...

SOUTH OF THE SLOT

.. WITH CUB CALLOWAY, ACE REPORTER

TONITE'S EPISODE ...

THERE'S A HOT TIME IN THE OLD TOWN TONITE..

SESSHIN LECTURE

BY ZENTATSU BAKER-ROSHI

(Introduction by Zen Center)

Zentatsu Baker-roshi, disciple of Suzuki-roshi, is the Abbot of Zen Center, teaching and practicing with students at the three locations of Zen Center: Tassajara Zen Mountain Center, Zen Center in San Francisco, and Green Gulch Farm near Muir Beach in Marin County.

A sesshin is an extended period of meditation, usually seven days. The meditation is from 2:30 or 3:30 in the morning until 9:30 or 10:30 or later at night. 40 minute periods of zazen (sitting meditation) are alternated with 10 or 15 minute periods of kinhin (walking meditation). The three daily meals are eaten in zazen posture.

- A single flow of mind and body that opens in all directions as concentration increases -

Dokusan (Sanzen) is the private meeting of teacher and student which occurs during the sesshin. Teisho (lecture) and Dokusan can only be given by a teacher who is the fully acknowledged disciple of his teacher, transmitting the mind and body and breath of the Buddhas and Patriarchs. Teisho is given once a day and is addressed to Buddha and to the students and to the teacher reflecting the presence, mind, and voice of the immediate occasion.

Many of you are fond of the gatha at the end of the Diamond Sutra:

> *As stars, a fault of vision, as a lamp,*
> *A mock show, dew drops, or a bubble,*
> *A dream, a lightning flash, or cloud,*
> *So should one view what is conditioned.**

This is not just a philosophical statement to aesthetically remind you that all is not permanent. It is a statement of what is actually so, a description of the actual nature of everything if you can look without a hint of accumulation, qualification, hesitation in your vision. It means to be lost without any way to measure anything.

In this sesshin you should not be trying to get through with some measurement, nor with a dependence on putting forth energy or a determination to get through no matter what. Just do each thing in turn without any idea of the next moment. A sesshin should disorder your usual order, take away what you usually rely on, until you find your real strength, until the reality that does not need measurement is manifest in you.

In his introduction to case number two in the Blue Cliff Records, Engo says that, "By comparison heaven and earth are too narrow, the sun, moon, and stars lose their brilliance. No teaching method, blows of the stick, thunderous shouts, can help us attain it. The Buddhas of past, present and future only know it in themselves. Generations of Patriarchs cannot expound it. All the sutras and Buddha's lifelong teaching are not enough to measure it. Even those with clear eyes who have taken on His way of life completely are helpless before it."

We need to be lost, to give up looking for meaning. We need darkness. It would be terrible if it were always light. So forget about night and day, sleeping and waking, near or far, before or after. Forget about where you are. But even though heaven and earth are too narrow, the universe too contracted, "the real way is not difficult, only without discrimination," says Joshu in the Main Subject of this story.

I want to speak for a moment about how we hold our eating bowls. Many of us pick them up using fingers and thumb as if our hand was some kind of implement that works very mechanically. In this kind of relationship the bowl is rather inactive, it is just something you hold with the mechanics of your fingers. But the way we eat in Zen, the way we handle things, the bowl should just rest in your hand. When you use the whole of your hand, the bowl is holding your hand and your hand is holding the bowl. There is some intimacy, some equality and participation of hand and bowl. Do you understand what I mean? It is like saying conditioned things are like a dewdrop. It is the sound of one hand clapping. You must act with everything so thoroughly and immediately that you are the dewdrop. There is no question of trying to make it something, trying to find a substitute.

In this beautiful spring time, when you see something, grass or flowers, if your yearning is to make the experience complete by finding some substitute in language or experience, if you feel it is not quite complete until you paint it or write it or do something about it – that is suffering. Grass is not green or anything in particular, it is not any interpretation. A drawing is a real drawing when it is independent, its own experience, as ashes are ashes and firewood firewood.

So abandon all hope, abandon any kind of location. It is a wonderful experience to realize that you are actually lost, just swimming. We do not know, here with this beautiful stone Buddha, with each other in this room, where this is. Do you know where this is, where we are? If you think you know, that is not right. When you can transcend these discriminations, here or there, near or far, big or small, before or after, lofty or common, space and time, then the real way is not difficult and you will know your one Mind, your original nature. This is to be really lost, to have no support, to be always found by you yourself, to find the life that does not need any special support, that is really like a dewdrop. In the Perfection of Wisdom in 700 Lines Manjusri states, "When one is not supported anywhere, just that, O Lord, is the development of perfect wisdom." Who is going to keep track anyway, your parents, your friends, your past, you who remember who you were? If things are really as a dewdrop, if you really believe that you must understand and experience everything without reliance on anything else, then there is nothing keeping track, and you can enter the real way.

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*Translation by Dr. Edward Conze

Lewis Richmond

Baker-roshi lecturing at Tassajara Zen Mountain Center.

If you try to pick up the bowl like your hand was a tool, already you are in some contracted world and do not know it. In that Introductory Word Engo goes on to say, "What is the use of specific questions? Even to call Buddha's name is like wallowing in mud and water." It means too much kindness from your teacher also cannot help you. "The word Zen in your mouth should make you blush. Now ponder what Joshu has to say."

The first story in the Blue Cliff Records, you remember, about Bodhidharma and the Emperor, is about how you find a teacher. Its theme is the relative and the absolute, holy reality and ordinary reality. And this second story too uses the theme of relative and absolute. But the second story is about once you've found your teacher, how do you practice with him? What is the relationship?

Studying Buddhism is difficult, because it's to bring it out of ourselves. Sutras, or heaven and earth, or thunderous blows, or your teacher, are not so much. It has to be brought out of you. As Engo says, "What is the use of specific questions?" He's asking, as Dogen did, What is the use of practice? So this story is about your standpoint in practice, your standpoint in relationship with your teacher. It is an intuitive story of our inner voice.

The case begins as Joshu, quoting Sosan's famous poem, says, "The real way is not difficult, it is only without discrimination." At this point Engo says, "What's this old Chinese bringing in his bunch of briars to us today for?" Do you understand? For Joshu to make a statement already is discrimination. Then Joshu says, "As soon as we say anything about it, it becomes little." In Engo's words, "Heaven and earth become contracted." As soon as we say anything, we must talk about the relative and the absolute. Joshu continues, "This old monk (Joshu) does not reside in cloudless clarity. What about you (you monks, who look up to cloudless clarity, the absolute), what do you say?"

So a monk comes up to Joshu. Maybe he is attached to his teacher being a sage, and Joshu is saying, "I'm not some sage, living in the absolute." Some say this monk is a little out of order, but I don't think so. He's a rather interesting person. He asks Joshu, "If you are not within cloudless clarity, if you don't reside in the absolute, how do you assess it?" A rather clever question. And he also means, what can we look for, how can we take the three refuges and the ten prohibitory precepts and the three pure precepts? What can we look up to, if you're not in the absolute. Joshu's reply is, "I don't know even this." But the monk is persistent. "How can you say 'I don't know' unless your standpoint is the absolute?" Isn't 'I don't know' already the absolute, he implies. And Joshu says, "Your questioning is over. Please bow and go back to your place." Go have lunch, go to bed. Do whatever is next. That is Joshu's way.

In this question and answer you see Joshu taking neither the standpoint of relative nor absolute. At one point he presents something broadside: The real way is not difficult. And then he says, I'm not in the absolute. Here he's presenting something upside down, in some confusing way. He's going against the stream, a boat going against the wind, maybe. And then when he says 'I don't know' he is just drifting — "Oh, I don't know." And the monk is still trying to make the answers fit together. If you try to do so, you'll never have any experience of the multiplicities of our existence or our real relationship with each other. So take the burden off your mind and eyes, and listen, just know the darkness. This sesshin is seven days and nights of darkness.

In the last response, Joshu just changes the context: Finish your bow and go back to your place. He's not slighting the question or questioner, and he's not caught by the framework of questions and answers. He's just taking one or another standpoint, but with some great respect and feeling for the questioner. When the monk makes his first question,

Sesshin in the zendo at the Zen Center's Green Gulch Farm, Marin County, California

Engo comments: "He needs a good thrashing," meaning, some teachers would thrash or be harsh with the person asking the question. And when Joshu says, "Go back to your seat," Engo says, "Some teachers would try to talk their way out of it by logic." But it's not necessary, you know, for question and answer to follow in order to know, to experience what we're talking about. Engo says, "You should know the weight by how it pulls on the hook, not by reading the numbers on the scale."

For teacher and disciple to practice together, we need to have some faith or sense of what we are talking about without the need tc make it explicit or tie it down. Engo's teacher said about Joshu's way, "He showed us by letting his arms dangle down." Nothing special, no eagle eye, dramatic Zen Master stuff. Just oh, O.K. Suzuki-roshi was very much like that. On the other hand, we don't want too much kindness, "wading hip-deep in mud and water," too much attempt to make some relationship. Maybe to give you an image of Buddha, or feeling of Buddha, he says is too much kindness. Already you have some special feeling of practice, "holy practice." Already it is too much. That is not beginner's mind. The difficulty is that we have too much confidence in our teacher and also too much confidence in the absolute. So you don't have any freedom. Suzuki-roshi pointed this out many times when he talked about this story. The problem, as he said, is that your teacher is right, but only for that moment. You shouldn't be too attached to it. So in this story Joshu and Engo and Setcho try to make it come out of the student, make it come out of each one of us, including the teacher.

Just put your strength here, in your stomach, and lift up through your backbone. You will realize you do not know where you are or what you are doing, yet even that which does not comprehend, functions. This is not some philosophical statement with illusion on one side and the absolute on the other. You are illusion and the absolute, right now, and something on which nothing can be written. This is not fooling around. There is no ducking. Dogen said, "Address the continuous body of Buddha, and realize the historical Buddha in yourself." Realize how that which does not comprehend also functions. I want you to give up your life in this sesshin, so that you can't remember who you were. Just to sit on your cushion this moment is all.

Setcho said, "The real way is not difficult. Words, phrases point to it. One has many ways. And two ways are not two. The sun rises at the edge of the sky, the pale moon sets. Beyond the porch railing, blue mountains. Cold water. From the skull, no sensation. How can joy arise. From the dry withered tree, a dragon moans. All is not dead. Difficult! Difficult! Relative and absolute. Friends, find out for yourself."

Suzuki-roshi said, "Sun and moon may not be one. Sun and moon may not be two." Engo said about Setcho's poem, "Oh, a double head with three faces. He is selling it retail." What is three faces? This is the utter darkness I have been talking about. Mountain and railing, near and far. What is near and far? Dragons do not live in pure water. Birds' feathers fill the air. Fish stir the water. From the distant, blue mountain, the water is cold.

Kassan Zenne, a disciple of a Dharma brother of our lineage, said, "The monkeys, clasping their young to their breasts, return behind the blue mountain. A bird with a flower in its beak lands before my green grotto study." This famous poem, again the utter darkness. From our stream of blood flowing in utter darkness, a withered tree comes to life, a dragon moans.

As you know, shortly before Suzuki-roshi died I asked him, "Where will I meet you?" And he brought his small hand out from underneath the covers and bowed to me and drew a circle in the air. This is relative and absolute. Which is relative and which is absolute? Where do we meet him? What

did he mean? His response is not limited to bowing or moving the covers or his lying there suffering. There is no beginning or end to his response. We always meet him whenever we bow, in everything we do and see.

There is no subject and object, no realm of achievement, everything is as a lightning flash and dewdrop, without merit and demerit. There is no realm in which anything other than a dewdrop can occur, except your own illusion of self. We are not a tub, you know, that we are rinsing out of negative things and filling up with good things. The realm of our actual existence is something like "do not use your hand as a tool."

If you realize Buddhism, it is because you teach yourself. I am temporarily your teacher and you are disciples, but actually, we are companions on the path, teacher and disciple simultaneously. Oneself reveals to oneself, Dogen points out. You possess Buddhism. Buddhism does not exist in these stories. It exists only in your own realization.

So the relationship of teacher and disciple is the real teacher. And the person who realizes Buddhism can be said to unite through practice the mudra of body speech and mind in the realm of intimacy and action. Mudra means, for example, that form of speech in which joy arises. Not that form of speech which most accurately conveys some information or accurately describes something according to our discriminating mind, not the surface of things, not honesty or even naturalness. Speech, action that is free from attachment, free from harming, free from creating. It disappears, and joy arises. This way you become the teachings themselves, the mudra in which enlightenment arises, the Bodhisattva. You are the vehicle of the Patriarchs and the enlightenment of all beings. These vows, these precepts, these mudra, these seals, are what make us a Buddha, a vehicle of Buddhism.

Usually we are caught in the surface of things and without the precepts to remind us how we are caught we try to find an equivalent satisfaction or relief again in the surfaces of things, in an objectification of our experience and an objectification of other beings. You need the precepts when you are already caught, when you have already broken the precepts. The precepts are the reverse of this objectifying process. The precepts show you when objectifying begins, when you have some idea of praising, criticizing, sizing up, possessing, hiding, lying, eliminating, et cetera. So you can see how you create yourself constantly and suffer the accumulation of that creating. If your state of mind is calm and not caught by the treadmill of objectifications, you effortlessly keep the precepts, always in the center of things. This is to recognize everything as Buddha, Dharma, and Sangha, rejoicing in the merit of others.

This is the half-lit world left behind. The illusion that we have some control over the surface of things is gone. You have realized how completely we live in the dark, you have relaxed and given yourself over to the precepts, to the refuges, to being a vehicle for Buddhism. You have entered that stream of blood that flows in utter darkness. Blow the lights out and you can feel what is happening. Blow even the idea of a light and a self out and you will feel and know your oneness with utter darkness. How wonderful it is!

The Sixth Patriarch says that when you have discarded outer form and your mind is not disturbed you have realized the unity of the relative and the absolute and Buddhism naturally arises. Joshu was asked, "What would you say to a man who possessed nothing?" "Throw it away," said Joshu. And yet when you have a possibility of not doing something, of letting something go, of giving up an old habit just once, you think "Well it's not of such importance, it is just one small thing, and I am so caught by my habit, this once will not help at all."

But this is 50%. If you can do it just when it occurs to you, this is the step on to a new path. This is the true meaning of being on the path, each step to enter a new path. There is no end to the originality, the creativity of a practice like this. Each moment reality is there, the creativity of you yourself.

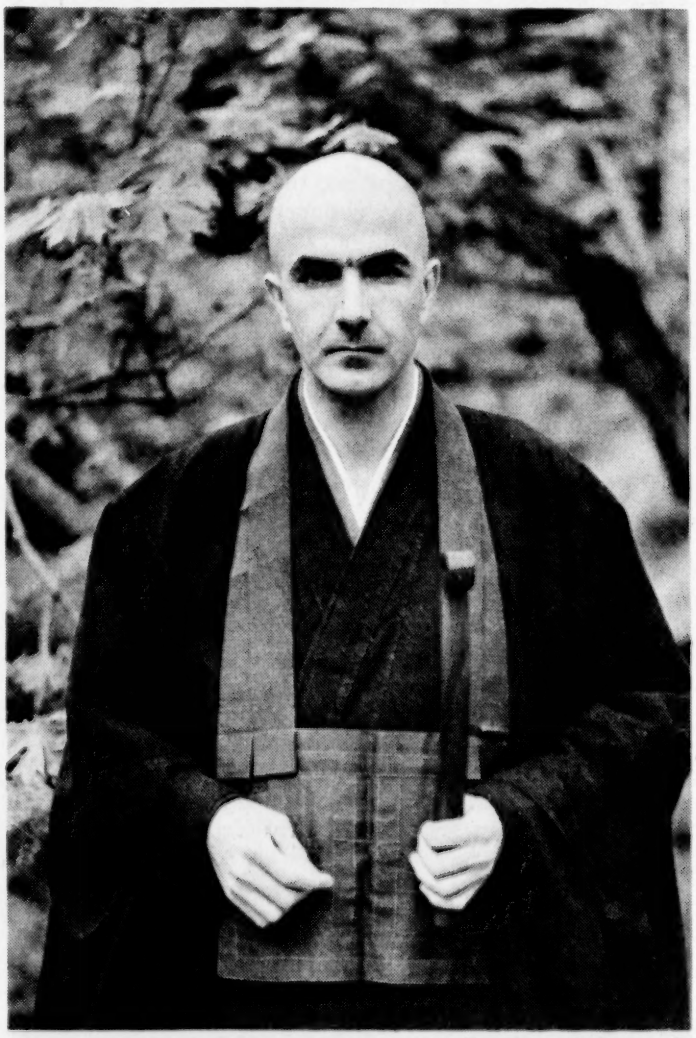
It is like Buddhism is a time capsule, time spansule. One of those pills that is released little by little. We are each given one and it will go off in us according to our circumstances and ripeness and practice. Suzuki-roshi gave me one and I am passing it to you. It is a pill which lasts forever. Different parts will go off in each of us. Each of us is the whole pill and as we realize ourselves, the pill will be opening according to each of our own circumstances and creativity. This is Buddha's own originality. This is a pill infinite in variety, as large and small as everything at once, a pill which we all simultaneously are. This description is straight from the Lotus Sutra. The Lotus Sutra makes clear that it is all of us and everything simultaneously that realizes Buddhahood, that is the Bodhisattva. This is our realm of intimacy and practice, beyond discrimination and time and space, near and far, before and after.

So we Buddhists do not go into political activity much or make big generalizations because we find that it is through our tiny acts each moment that we enter the new road with everyone. This is to act in zero, to act in utter darkness. Two joined make one, and all joined make 0. And it is in the 0 in which we act, this utter darkness. Dogen wrote:

This slowly drifting cloud is pitiful
What dreamwalkers we are!
Awakened, the one true thing,
Black rain on the temple roof.

Stopping the world.

[more ➔]



Zentatsu Baker-roshi

It has come to you before. Moments when your mind and body saw, moments that you remember clearly, but then you lapsed back into unconsciousness. Until you started to practice, until you noticed something again, until you saw a trace of the ox. And now your practice is in this sesshin to awaken that mudra or form which is emptiness, which will bring you back to consciousness.

The problem is the same for us. We may establish a good place to practice here, and a healthy community. But that is not so important, you know. The important thing is that you join this stream of blood that flows in utter darkness. That you continue this stream, continue this way of Suzuki-roshi and Dogen Zenji and Setcho Zenji and Engo Zenji. You actually are doing it.

Suzuki-roshi said, "When I was with my teacher, I usually felt he was really my teacher and I treated him completely as my teacher. But after my teacher died I realized I did not know what a teacher was at all and had not understood him nor what he was trying to show me. But then I felt I knew finally what he was trying to say, I realized his great kindness and effort. But then again the following year I felt that I had not understood. And each year I realized again." It is always this way. The dry dead branches of winter come out in springtime with fresh colors and blossoms. But even in our lifetime it may not come out. Our way may look dead, even for many generations, but when conditions are right it will come out again perfectly according to circumstances. So we should make no special effort to express Buddhism, or worry if we are not a great teacher. We should just take the great pill of the vehicle of Buddhism completely. Suzuki-roshi had no idea of being a great teacher. He just took care of his responsibilities in Japan, of the temples he inherited, repairing them, and humbly continuing his study of Buddhism as a student, until he came to America and saw our great need and shared his realization with us, giving us this great practice to realize ourselves.

This is the wonderful activity and supernatural power of Layman P'ang carrying water and chopping wood. Doing whatever comes to hand. This is Hotetsu fanning himself, ripening the gold of the earth and the cream of the long rivers. This is knowing the transiency of the world and the purity of intention, the reality of utter darkness and our stream of blood.

[Poems beginning and ending the mondo (question and answer ceremony) at the end of sesshin]

The ways of Zen are numerous,
Your own single!
Each step a new road.
What is this 50%?

When your pure intention covers the whole earth
You can trust what occurs to you.
The blue monkeys do not know the mountain
But possess the whole of Buddhism.

[Poems from the next mondo ceremony]

You know the great kindness of the Patriarchs.
You know that your companions are waiting for you.
Are you going to waste time looking for the door?
Enter immediately.
In your smallest act the source-vehicle,
Fire on your fingertips.
This precision is necessary to make the Buddha blink.

The Patriarchs mattocks have burst into bloom.
Even the non-conceptual body, flown away.
Observe the three-root-of-excellence
with perfected consciousness.
And you will find old Maitreya in the coat-line! ■

I DIMINISH MYSELF

BY HUEY P. NEWTON

If I define myself as my thumb
I deny myself my fingers
If I define myself as my fingers
I deny myself my hand
If I define myself as my hand
I deny myself my arm
If I define myself as my arm
I deny myself my body
If I define myself as my body
I deny myself my universe
I diminish myself

THE UNKNOWN

I heard God call
I got my gun and waited
When he appeared I realized
and I took the gun from my head.

EGO

one day i suddenly realized i had forgotten:
name
age
sex
address
race
I had found myself

John R. Cream — Black Panther Party

These poems and others by Huey Newton appear in the excellent **City Lights Anthology**, *Lawrence Ferlinghetti, ed. 1974, 250pp., $5.95 from City Lights, 1562 Grant Ave., San Francisco, CA 94133.*

The poems are excerpted from a new City Lights book, **Insights & Poems**, *by Ericka Huggins and Huey P. Newton, 1975, 64pp., $2.50.*

— SB

Counsel for a suicide's friend

Dear Prof. Bateson: 23 May

I talked with you yesterday morning and near the end you asked me if I had any specific questions I did but couldn't bring myself to ask them, but find that I really do want to ask them so this letter.

First unasked question has to do with something said to the effect that "if your heart's in the frying pan, then you can't go wrong." Well, obviously, nothing much can be done if your heart's not in the frying pan, but what if you guts are in it and things go wrong.

What I'm talking about is I was introduced to a young woman about two years ago by my ex-shrink because he was feeling a bit stuck with her & on the other her craziness reminded him of mine, so she & I became friends & struggled through a lot of "if it's not clean, I'll prove it" stuff and "Are you going to desert me/believe I'm a terrible person now? now? now?" stuff.

Anyway she suicided eight months ago. At 21.

I am not willing to accept the premise that we were not really friends as I know I was there and was paying attention. So I'm stuck, amongst other things, with trying to sort out how I can legitimately (to myself mainly) aspire to trying to help others with their craziness? Have I the courage – yes and no. That is, I still think I understand some of it, but doubt whether that understanding is sufficient. And if it isn't, what is?

Which brings me to unasked question #2. One thing that looks to me as if it had the possibility of being sufficient is small communities like Kingsley Hall, the Granville Road house, etc. What mostly worries me about them is how do you get a community stable enough to sustain itself and support people working on their mess but not get tangled up in questions of stability and/or minimizing chaos as to interfere with people's working?

Respectfully

---

27 May 1973

Dear _____

I am sorry I did not manage to answer your letter while I was in Seattle.

I suggest that you consider and complete in your imagination the following scenario (after all, it is in your imagination that change is requested or needed):

Your friend has achieved her suicide and arrived at the Pearly Gates, where she is challenged by St. Peter, who notes that she has come too soon. She says that it was all _____'s fault.

There are many ways of completing the scenario, but one way or another, your friend has to demonstrate that she had no free will but you had. I suggest either that you both had free will or that neither of you had.

Of course it is gratifying to you and to all therapists to believe that they have more free will than their patients. But it won't do.

Your problem is to stop the boat rocking between the arrogance of "I had the power and the knowledge to help" and the self repudiation of "I failed."

Your second question is much more difficult, but the answer is I suppose really a corollary following from what I have just said. You will always be terrified of the things which will inevitably happen in any therapeutic community if you start out with a false estimate of the power and the wisdom of whoever it is that runs the community (especially if it's you). What one human being can do for another is not quite nothing, but it probably sometimes helps the helpee when the helper is clear about how little help can be given. Some temporary protection from the cold winds of an insane civilization, some shared tears and laughter, and that's about it.

Yours sincerely,

Gregory Bateson
Santa Cruz, California

The Wheel of Death

Sentimentalizing death is a disservice. This book by the author of **Three Pillars of Zen** *assembles sundry anecdotes and quotes primarily from the Buddhist tradition, which treats death as a lesson.*

Quotes in the following article "The Posthumous Journey of the Soul" are from **The Wheel of Death**, *at Stan Grof's request.*

– SB

The Wheel of Death
(A Collection of Writings from Zen Buddhist and Other Sources on Death, Rebirth, Dying)
Philip Kapleau, ed.
1971; 110pp.
$2.25 postpaid
from:
Harper Colophon Books
10 East 53rd Street
New York, NY 10022
or Whole Earth

A man who dies before he dies
does not die when he dies.

– Abraham a Sancta Clara

•

Various writings on the art of dying say that, where possible, three days should elapse before the body is embalmed, cut up or treated in any way so as to permit the life-forces to withdraw from the body and enter the intermediate stage.

•

It cannot be stressed too often that the funeral rites are for the benefit of the deceased himself, and that the family must comply with his expressed wishes as to who shall perform them, and how. Similarly, his instructions for the disposition of his own body and the performance of subsequent rites must not be ignored.

The Posthumous Journey of the Soul– Myth & Science

BY STANISLAV GROF, M.D. AND JOAN HALIFAX-GROF, PH.D.

Photographs by Larry Keenan Jr.

What the dying learn has been of interest to the living for some while now.

Stan Grof has been collecting experience on the subject since his earliest work with LSD in 1956 in Czechoslovakia. Since that time he has sat with over 3,000 psychedelic sessions, some 100 of them with terminal patients (most of those at the Maryland Psychiatric Research Center, Spring Grove Hospital. At present Stan and anthropologist Joan Halifax-Grof reside and organize programs at Esalen Institute, Big Sur, California. It was Gregory Bateson who sent the Grofs our way.

What follows is a chapter from their book **The Human Encounter With Death**, *to be published by Viking Press in 1976.*

– SB

Few ideas and beliefs have occurred in the history of mankind with the same degree of constancy and frequency as those related to the continuation of existence beyond the moment of biological demise. The concept of afterlife has taken many specific forms in different cultures, but the basic underlying idea is the same, namely that death does not terminate human existence entirely and that in one way or another life or consciousness will continue. Sometimes the image of the afterworld is very concrete and real, not dissimilar to earthly existence. More frequently, the realms of the world beyond have special characteristics distinguishing them from anything known on earth. Many peoples have developed a concept of the posthumous journey of the soul, where the deceased has to undergo a complicated process of transitions through levels and realms of the otherworld.

In psychiatric and psychological books, the concept of afterlife and of the spiritual journey after death has usually been treated as a manifestation of magical thinking, or as an expression of reluctance and inability to accept the idea of human impermanence. Until recently it was hardly ever considered that the descriptions of ancient and aboriginal cultures concerning the posthumous adventures of the soul could reflect experiential reality. Reports describing subjective experiences associated with clinical death, if studied carefully and with an open mind bring, however, evidence that various eschatological mythologies represent actual maps of unusual states of consciousness experienced by dying individuals. Psychedelic research conducted in the last two decades has brought important phenomenological and neurophysiological data indicating that experiences involving complicated mythological, religious, and mystical sequences before, during, and after death might well be a clinical reality rather than wishful fiction. The possibility of extricating this area from the realm of superstition and fantasy and subjecting it to scientific scrutiny is so intriguing that it deserves a systematic discussion and elaboration.

Comparative studies of the concepts of afterlife and of the posthumous journey of the soul reveal striking similarities between cultures and ethnic groups separated historically and geographically. The recurrence of certain motifs and themes in different time periods and remote countries is quite astounding. The ideal of the final home of the righteous after death, heaven or paradise, appears in many different variations. In the Christian tradition there are two different ways of representing heaven. One reflects a theological and metaphysical concept of heaven, as a state in which hierarchies of angels and saints enjoy the presence of God and contemplate his being. The symbolism associated with it combines the Hebraic image of a region in the sky with the Greek idea of celestial spheres outside one another and of the spiritual

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journey. The other mode has its roots in the myth of the Golden Age and the Garden of Eden; it is the idea of Paradise, or the Garden of Love. The symbolism used for this concept involves a geographical location, elements of pristine nature (grass, flowers, trees, rivers, and tame animals), beautiful fragrances, walls of gold, and roads paved with emeralds.

The Koran promises the faithful a pradise reflecting male Arab tastes. It has the form of a beautiful oasis, with gardens, rivers, and luscious trees. Men are clad in silken robes and lie on couches feasting on fruit and wine; unlimited hosts of black-eyed houris serve the pleasures of the faithful Muslim. Having satisfied the sexual desires of their clients, these girls resume their pristine virginal status. Classical Greece had the Isles of the Blest with the plain of Elysium, located over the waters of the Atlantic at the world's end. It had an ideal climate with no rains, snow falls, or strong winds, and its fertile land bore honey-sweet fruit thrice a year. The Orphic mystics, who taught salvation as a release from matter and earthly bondage, saw the Elysian fields as a happy resting place for pure spirits, at first located in an underworld of strange brightness, later in the upper regions of the sky.

The Aztecs distinguished three different paradises to which souls went after death. The first and lowest of these was Tlalocan, land of water and mist. It was a place of abundance, blessedness, and serenity. The happiness experienced there was of a very earthly variety. The dead sang songs, played leap-frog and chased butterflies. The trees were heavy with fruit and the land covered with maize, pumpkins, green peppers, tomatoes, beans, and flowers. Tlillan-Tlapallan was the paradise of the initiates who were followers of the teachings of Quetzalcoatl, the god-king symbolizing rebirth. It was referred to as the land of the fleshless; it was an abode for those who had learned to live outside their physical bodies and unattached to them. The highest paradise was Tonatiuhichan, House of the Sun. It seems that this paradise was a place for those who achieved full illumination. They were the privileged ones who were chosen as daily companions of the sun and lived a life of pure delight.

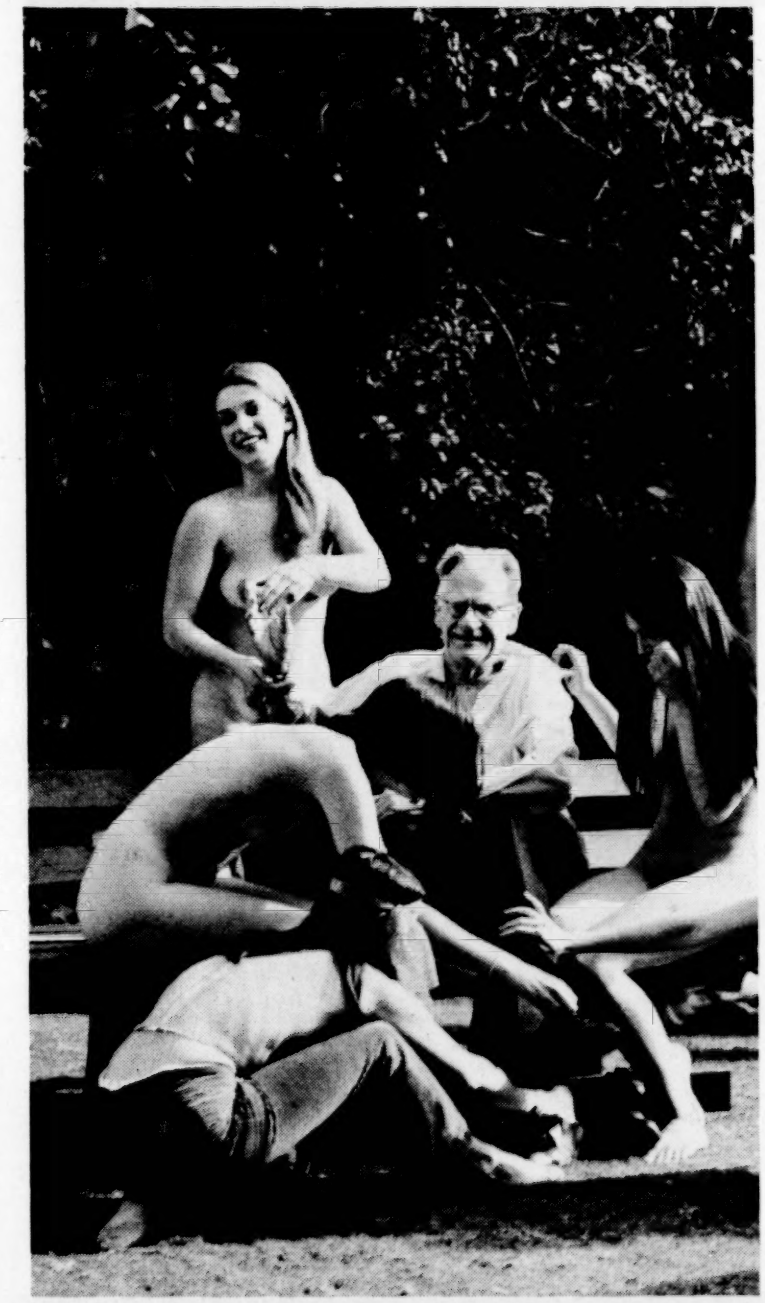
In the Nordic tradition, access to Valhalla was gained on the basis of martial prowess. Here, the warriors were engaged in splended tournaments during the day and at night feasted together on pork and mead. According to the ancient Vedic tradition of India, Yama, the ruler of the dead, reigned in the realm of light in the outer sky. The life of all the worthy deceased was free of pain and care; they enjoyed music, sexual fulfillment, and sensual pleasures. In Hinduism, the regions above the clouds are places of beauty and joy and are inhabited by various deities; the access to these regions is gained by a proper way of life and correct performance of rituals. The Buddhist concepts related to the soul's resting place are to a great degree derived from Hindu mythology. Mahayana Buddhism has a graded hierarchy of paradises inhabited by deities and spiritual beings. However, these heavens do not represent the ultimate goal of Buddhist religion and philosophy. They are temporary stations for those who are not ready to give personal desires and attachments and achieve total release from the bondage of personality. The concept of paradise as a place of the dead exists in many aboriginal cultures. Thus, some North American Indian tribes such as the Ojibway, Choctaw, and Sioux believed that the deceased inhabit the region of sunset or the happy hunting grounds. Some Eskimo peoples see their dead in the radiance of the aurora borealis joyfully playing with the head of a walrus. The Tumbuka in Malawi have the concept of a spirit realm in the underworld where the departed are always young and never unhappy or hungry.

The concept of hell or purgatory, a place where the departed will be exposed to inhuman tortures, is equally ubiquitous as that of heaven or paradise. In the Hebraic tradition the dead go to Sheol, which is a great pit or a walled city, "the land of forgetfulness," "the land of silence." There they live in dust, darkness, and ignorance, all covered by maggots and forgotten by Yahweh. Gehenna is a deep valley with burning fire where the wicked are tormented in the flames. The Christian picture of hell involves hierarchies of vicious devils exposing the damned to tortures by physical pain, horror, and fiery heat. It is located far underground with entrances through dark woods, volcanoes or through the gaping mouth of Leviathan. The book of Revelation mentions the lake that burns with fire and brimstone; it is the final destination of the cowardly, the faithless, the polluted, murderers, fornicators, sorcerers, idolators, and all liars. Less frequently cold and ice are described as instruments of torture. This is true for the medieval image of the cold hell and for the lowest circle of hell in Dante's Inferno. Freezing cold also characterized Nifelheim, the Nordic underworld, ruled by the fierce and ruthless goddess Hel. The Islamic picture of hell bears a close similarity to that of the Judaeo-Christian tradition from which it was derived. The Greek underworld Hades was a place of dreary darkness, described by Homer as "the hateful Chambers of Decay that fill the gods themselves with horror." It was located either in the deep underground or far in the west; the principal river of the underworld was Styx, across which the dead had to be ferried by Charon. Those who have personally insulted Zeus are imprisioned in the bottomless pit of Tartarus and undergo agonizing torments. In Persian Zoroastrianism, hell is in the far north, in the depths of the earth. It is a dark place, foul and stinking and teeming with demons. There the damned souls, "the followers of the lie" have to remain after death in pain and misery until the God of Darkness Ahriman himself is destroyed. The Aztec underworld Mictlan was a region of utter darkness ruled by the terrible Lord of the Dead, Mictlantecuhtli. His face was covered by a mask in the form of a human skull. His black, curly hair was studded with starlike eyes and a human bone protruded from his ear. In the Aztec tradition, it was not the conduct of the deceased that determined his fate after death, but his occupation and the manner of his death. Those dead who were not selected for one of the paradises were subjected in Mictlan to a series of magical trials. They had to pass through nine hells before they reached their final rest. These hells should not be considered as places to which the wicked went for punishment. They were regarded as a necessary point of transition in the cycle of creation. It was inevitable in the cosmic process that all created things plunge into matter and return back to light and their creator. In Hinduism and Buddhism, there are numerous types and levels of hell. Similarly to the various paradises, they are not places where the deceased stay forever; they are merely transitional stages in the cycle of birth, death, and rebirth. The tortures experienced in these hells are at least as multiform, diabolic, and ingenious as those described in the above traditions.

Another recurrent theme in eschatological mythology is the Judgment of the Dead. Christian art abounds in images of the Judgment of the Dead where devils and angels are fighting

I shan't die, I shan't go anywhere,
I'll be here;
But don't ask me anything,
I shan't answer.

– Death verse of Master Ikkyu



for the soul of the deceased, or in depictions of the Last Judgment with the just ascending into heaven and the damned devoured by the mouth of hell. In the Islamic religion two angels, Munker and Nakeer, come to examine and interrogate the dead. If he is found righteous, he is refreshed by air and perfume and a door is opened for him towards paradise. The infidel is clad in garments from hell and infernal doors open for him; the heat and pestilential wind of hell envelop him, and the grave closes in on him and crushes his ribs. There he has to remain in agony until the day of resurrection. The Moslem tradition speaks also of the Sirat, which is a bridge over hell, "finer than a hair and sharper than a sword," which all departed must cross. Believers are able to keep their balance and cross successfully; unbelievers will slip and plunge into the infernal abyss. Crossing of the bridge also plays an important role in the judgment of the dead of the Zoroastrian religion. A deity named "just Rashnu" weighs the evil deeds of the departed against his noble deeds. After this procedure, the deceased undergo a special ordeal; they have to make an attempt to cross the Cinvato paratu or "Bridge of the Separator." Those who are found just easily pass across the bridge to eternal bliss, while those who are found wicked are seized by the demon Vizarsh.

The earliest descriptions of the Judgment of the Dead are found in the funerary texts known as the Egyptian Book of the Dead, which date back to about 2400 B.C. The judgment scene, psychostasis, takes place in the Hall of the Two Truths of Hall of Maat. In the scale-pans of a great balance, the heart of the deceased is weighed against the feather of the Goddess Maat symbolizing truth and justice. The balance is attended by the jackal-headed God Anubis, while the ibis-headed God Thoth, God of wisdom and divine scribe, records the verdict as an impartial judge. The triform monster Amemet, Devourer of Souls, stands by ready to swallow those who fell through at the trial. The just are introduced by Horus to Osiris, who accepts them into the pleasures of his kingdom. In the Tibetan version of the judgment scene, the administrator of truth and justice is called Dharma-Raja, the King of Truth, or Yama-Raja, the King of the Dead. He is adorned with human skulls, a human hide and a serpent, and holds the mirror of Karma in his left hand. This mirror reflects every good and evil act of the dead; these are symbolized by white and black pebbles and weighed against each other. From the court lead six karmic pathways to separate lokas, realms in which the deceased will be reborn according to his credits and debits. Typical punishments in various hells of the lower world include tortures by heat and cold, hacking to pieces, affixing to the Spiked Tree, pouring of molten metal into apertures of the body, or detention in the terrible Avitchi Hell where those who are guilty of heinous sins endure punishment for ages that are almost immeasurable. In Japanese Buddhism, the ruler and supreme judge is called Emma O. In this version, two severed heads testify for and against the deceased. The white head brings forth his good deeds, while the red one discloses his transgressions and crimes.

The fate of the departed is often represented as a path, a journey, or a specific sequence of events. Some of the descriptions appear to be rather naive, while others represent a complicated and sophisticated cartography of unusual subjective experiences. It is interesting to mention in this context that there exist deep parallels between the basic characteristics of the posthumous journey of the soul as represented in various cultures and the experiences characterizing the shaman's journey or the initiation in temple mysteries and rites of passage. As will be indicated later in this chapter, similar or identical experiential elements also form an important part of psychedelic sessions.

The Guarayo Indians of Bolivia believe that after death the soul has to choose between two paths. One is broad and comfortable, the other narrow and dangerous; the soul should not let itself be seduced by the seeming advantages of the easy road and should take the difficult one. It has to cross two rivers, one on the back of a gigantic alligator, the other on a tree trunk. Other dangers await the soul during this journey. It has to negotiate through dark land by the light of a burning straw and pass between two clashing rocks. After all perils are successfully overcome, the soul arrives in a beautiful land with flowering trees and singing birds where it will live happily for all eternity.

Similar, although more complicated, is the soul's journey to the spirit world in the tradition of the Huichol Indians in Mexico, as it has been orally transmitted from generation to generation and depicted in yarn-paintings. The first part of this path is straight, but from a point called "The Place of the Black Rocks," splits into two directions. From there the Huichol with a pure heart takes the right path; a Huichol who has committed incest or had sexual intercourse with a Spaniard has to go to the left. On the left road the Huichol who has transgressed must undergo a sequence of agonizing ordeals; he is impaled on a large thorn, beaten by the souls of the people he has illicitly enjoyed in his lifetime, fried by a purifying fire, crushed by clashing rocks, and is forced to

drink hot, foul-smelling water full of worms and slime. After this he is allowed to return to the separation of the paths at the Black Rocks. Here he may continue on the right path which will take him to his ancestors. On this journey, he must symbolically appease a dog and a crow, two animals who are traditionally badly treated by the Huichols. He encounters a possum, (coati) and has to prove that he has not eaten the meat of this animal that is sacred to the Huichols. Then he encounters a caterpillar, symbol for his first sexual experience. At a wild fig tree the souls dispose of the burdens of sexual organs and obtain in turn its fruit. After a great feast with figs, maize beer, and peyote, all souls join together and dance around Tatewari (Our Grandfather Fire).

The Huichol concept of the posthumous journey has certain elements in common with the descriptions of ancient Aztecs from whom the Huichols derive their origin. According to the Aztec religion, the dead had to undergo a series of ordeals involving crossing of a deep river guarded by a yellow dog, passing over a mountain of obsidian, exposure to icy wind, being pierced by sharp arrows, and attacks of wild beasts devouring human hearts. The Aztecs performed complicated rituals to ease the posthumous journey of their fellow tribesmen.

Two cultures in the history of mankind seemed to show particular concern about and interest in the process of dying, namely Egypt and Tibet. The priests in these two cultures conducted elaborate rituals to ease the ultimate transition and developed sophisticated maps as guidelines for the post-humous journey of the soul. The written forms of these manuals became known in the West as the Egyptian Book of the Dead and the Tibetan Book of the Dead. These two sacred texts are documents of great relevance in regard to the theme of this chapter and deserve more detailed discussion.

The Egyptian Book of the Dead* is a title referring to a collection of funerary texts which the ancient Egyptian scribes composed for the benefit of the noble dead. These consist of spells and incantations, hymns and litanies, magical formulae, and prayers. The Book of the Dead was the product of a long development of religious beliefs and ritual practice. Many of the sections can be traced back to earlier collections of funerary texts inscribed in hieroglyphs on the interior walls of certain pyramids in Sakkara (the Pyramid Texts) and later on the sides of wooden coffins (the Coffin Texts). The Pyramid Texts originated between 2350 and 2175 B.C. and are the oldest written records not only in Egypt but in the entire history of mankind; however, the material they contain points to sources that are even more archaic.

From first to last, the texts reveal the unalterable belief of the Egyptians in the resurrection and in the immortality of

*The name, "The Egyptian Book of the Dead" is misleading. The texts do not form a comprehensive and connected work and do not belong to one historical period; they span a time period of several millenia. The title is actually a translation of the name given by the Egyptian tomb-robbers to every roll of inscribed papyrus they found with mummies — "Kitab al-Mayyitun" — book of the dead persons. The ancient Egyptian title was "part am hru" translated usually as "manifestation in the light" or "coming forth by day."

the soul. However, egyptologists have pointed out an apparent conflict in the heterogeneous material of the texts. On the one hand, great emphasis was put on the role of the Sun God and his divine retinue. The texts were supposed to provide magical means facilitating the ascent of the departed to the sky where he would enjoy for eternity blessed afterlife, accompanying the Sun God on the solar barge. Yet another, older tradition of the ancient mortuary god Osiris* permeates the texts. A dead person who was ritually identified with Osiris could be raised to life again. Thus, the texts include rituals for use in embalming and funeral rites together with hymns, incantations, myths, prayers, and magic spells.

According to Egyptian mythology, the Sun-god Afu-Ra travels during the day in his boat across the sky. At sunset, the solar boat passes through the chain of mountains in the west and during nighttime continues its journey through the Tuat, the otherworld and abode of the dead. A district of the Tuat called Sekhet Aaru, Fields of Reeds, was the kingdom of Osiris where he lived with his court. Only those who passed the judgment in the Hall of Maat were admitted to this realm. The Tuat had twelve regions, one for each hour that the solar barge spends in the otherworld at nighttime. Each region of the Tuat had a gate protected by three guardian deities and represented specific dangers for the solar crew. The companions of the Sun god had to struggle through places of blazing fire, where heat, fumes, and vapors were destroying nostrils and mouths. A number of hideous beings, fantastic creatures, and monstrous serpents threatened them on their way.** The most dangerous of these perils was Osiris' brother Set in the form of Aapep, a gigantic serpent attempting to devour the solar disc. Every day Afu Ra completed his journey through the Tuat, triumphed over all its dangers, killed Aapep with the help of the feline goddess Bastet and rose in the sky through the Eastern mountains to give heat, light, and life. The Egyptians assumed that the soul of the deceased underwent the same struggles and transformations as Afu Ra.

Bardo Thodol,*** the Tibetan Book of the Dead, is of much more recent origin than its Egyptian counterpart and seems to have more inner consistency and congruence. It was first put to writing by Padma Sambhava, in the eighth century AD; and was used in funeral rituals by different sects all over Tibet. It is a guide for the dying and the dead, a manual helping the departed to identify various stages of the intermediate state between death and rebirth and attain liberation. The Tibetans distinguish a total of six so-called intermediate states or Bardos. The first one is the natural state of Bardo while in the womb. The second is the Bardo of the dream state. The third is the Bardo of ecstatic equilibrium while in deep meditation. The remaining three Bardos are associated with death and rebirth; these are described in detail in the Tibetan Book of the Dead. They are the Bardo of the moment of death, the Bardo of experiencing the karmic illusions during the dream state following death, and finally the Bardo of the inverse process of sangsaric existence while seeking rebirth.

The first part of Bardo Thodol, called Chikhai Bardo, describes the psychic happenings at the moment of death. The three chief symptoms heralding imminent death are a bodily sensation of pressure ("earth sinking into water"), clammy coolness gradually turning into feverish heat ("water sinking into fire"), and a feeling as though the body were blown to atoms ("fire sinking into air"). At the moment of death, the departed has a vision of Primary Clear Light of Pure Reality. If he is not frightened by its overwhelming intensity, he can attain instant liberation. If he allows himself to be deterred, he has another chance later, when the secondary clear light dawns upon him. If he misses this opportunity as well, he gets involved in a complicated sequence of spiritual events during which his consciousness becomes progressively more estranged from the liberating truth as he is approaching another rebirth.

In the Cohnyid Bardo, or the Bardo of the Experiencing of Reality, he envisions successively a pantheon of Peaceful Deities enveloped in brilliant light of different colors; Doorkeeping, Wrathful, Knowledge-Holding Deities, and Yoginis of the Four Cardinal Points. Simultaneously with the overwhelming presence of these deities, the departed perceives dull lights of various colors, indicating the individual lokas, or realms into which one can be born: the realm of the gods (devaloka), the realm of the titans (asuraloka), the realm of the humans (manakaloka), the realm of brute subhuman creatures (tiryakaloka), the realm of the hungry ghosts (pretaloka), and the realm of hell (narakaloka). The attraction to these dull lights can interfere with spiritual liberation and indicate proclivity to rebirth.

If the departed has missed the opportunity for liberation in the first two Bardos, he enters the Sidpa Bardo, or the Bardo of seeking rebirth. At this stage the departed is warned not to desire miraculous karmic powers that he seems to manifest and get attached to them. His Bardo body that is now composed of gross matter is endowed with the power of unimpeded motion and can penetrate through solid objects. He can appear or disappear at will, change his size, shape, or number, and appear instantaneously in whatever place.

Happiness or misery experienced in the Sidpa Bardo depends upon the karmic record of the departed. Those who have accumulated much bad karma will be tormented in this Bardo by frightening events such as horrifying screams, flesh-eating rakshasas wearing weapons, terrible beasts of prey, and raging elemental forces of nature – clashing and crumbling rocks, angry overflowing seas, roaring of fire, or ominous crevices and precipices. Those who have accumulated karmic merit will experience various delightful pleasures, while those with neutral karma will find colorless stupidity and indifference. An important part of this Bardo is the scene of Judgment during which the King and Judge of the Dead, Yama-Raja, examines the past actions of the deceased with the help of his karmic mirror and assigns him to the fate he deserves.

[more ➔]

*Osiris, one of four divine siblings of the Egyptian pantheon, was killed and dismembered by his evil brother Set. His sister Nephthys and his wife-sister Isis found the parts of his body scattered in the Nile delta, reassembled them in a rawhide, and resurrected Osiris with the help of Osiris' son Horus. In a fierce battle that followed, Horus killed Set and avenged his father. The legend about the death and resurrection of Osiris is central for the understanding of his role in the Egyptian death mythology and in the death-rebirth mysteries.

**Detailed information about the fiends and monsters inhabiting the Tuat can be found in the "Am Tuat," (Book of Him That Is in the Tuat) and in the "Book of Gates."

***Bardo Thodol means literally "Liberation by Hearing on the After-Death Plane."

Riding this wooden upside-down horse,
I'm about to gallop through the void.
Would you seek to trace me?
Ha! Try catching the tempest in a net.

– Death verse of Master Kukoku

During the Sidpa Bardo the experiencer will make frustrating attempts to reenter the dead body, but finds it decomposed, cremated, interred, frozen, thrown into water, or given to birds and beasts of prey. At this point it is important for him to realize that all of his experiences are only hallucinations, products of his own mind, and essentially voidness. If this moment is missed, rebirth will invariably follow and it will take innumerable aeons before one comes out of the quagmire of misery. When the light of the six lokas are dawning on the departed, an attempt can be made to close the door of the womb. The Bardo Thodol suggests several approaches to achieve this purpose. One can contemplate on one's tutelary deity, try to realize that all apparitions are sangsaric illusions, meditate upon the clear light, focus on the chain of good karma, avoid attraction by visions of male and female figures in union, or seek detachment from the ambivalent forces of Oedipal bonds to one's future parents.

If liberation has not occurred, one will be maneuvered by vivid illusions irresistibly toward new birth. There occur various signs characteristic of individual places of birth, lokas. With proper guidance the deceased who has missed the many opportunities to attain liberation in the three Bardos still can influence the choice of the womb he will be born into.

The descriptions of the spiritual adventures of the dying and dead whether presented in the form of aboriginal mythologies or in elaborate versions such as in Tibetan Buddhism, have attracted very little attention of Western scientists. As indicated in the introduction to this chapter, eschatological mythology has been treated as an expression of massive denial of man's impermanence and an attempt to overcome the fear of death and the unknown. This situation was not noticeably influenced by the fact that actual subjective accounts of death and near-death experiences, as well as death-bed observations by physicians and nurses in the few existing studies showed great similarity to ancient and aboriginal descriptions of the phenomenology of death. At least two exceptions should be mentioned in this context; although both of them were men of considerable stature, their opinions did not change the overall feelings about the matter. Carl Gustav Jung, as a result of his extensive studies in comparative mythology, unusual intuitive capacity, and his own near-death experience, recognized the extraordinary value of the Bardo Thodol (and similar texts describing post-mortem experiences) for understanding the human mind. Aldous Huxley suggested on the basis of his own psychedelic experiences that such concepts as hell and heaven represent subjective realities that can be experienced in a very concrete and convincing way in unusual states of mind induced by drugs or various powerful non-drug techniques.

Systematic clinical research with LSD has brough ample evidence supporting Huxley's idea. Subjects unsophisticated in anthropology and mythology experience without any specific programming images, episodes, and even entire thematic sequences that bear a striking similarity to the descriptions of the posthumous journey of the soul and the death-rebirth mysteries of various cultures. Psychedelic drugs have made it possible for the interested researcher to study the deep parallels and unusual interrelations between the death-rebirth phenomenon in psychedelic sessions and actual near-death and death experiences; maps of the post-mortem journey developed by various cultures; and psychological events occurring in rites of passage, temple mysteries, and other rituals focussing on death and rebirth. Closer examination reveals that the extended map of the human unconscious developed on the basis of observations from LSD research is applicable to all the related states described above. Some of the experiences involved in all these situations are of an abstract nature. Not infrequently do persons experience beautiful colors and ornamental patterns while approaching death, as demonstrated by the study done by Karlis Osis. Also the psychodynamic level of the unconscious is frequently involved in the multifaceted and multilevel experience of dying. Reliving of important individual memories, the phenomena of age regression and life review, as well as working through interpersonal conflicts and giving up specific attachments are examples of this category. However, most of the profound phenomena associated with dying seem to originate on the perinatal level. Such complex experiences as that of heaven or paradise, hell, purgatory, Last Judgment, salvation, and spiritual liberation are related to various perinatal matrices and thus to the corresponding stages of biological birth. The experience of cosmic unity, heaven, or paradise occurs in close connection with the embryonic feelings of prenatal existence before the onset of delivery. The encounter with various images of hell coincides with the "no exit" situation related to the first clinical stage of delivery. The concept of purgatory seems to occur when subjects are undergoing the death-rebirth struggle associated with the propulsion through the birth canal in the second stage. In this context some individuals experience shattering scenes of the Judgment of the Dead. Typical scenes of salvation and redemption seem to coincide with the reliving of the moment of biological birth. The theme of descent into the underworld or into the depth of the ocean and that of the ascent, so typical for eschatological mythology, are related on this continuum to the transition from cosmic unity to hell (the beginning of delivery), and to the shift from the death-(re)birth struggle to the death-rebirth experience (completion of the delivery), respectively. Many additional aspects of the spiritual journey after death can be related to various types of transpersonal phenomena. Here belong, for example, the

encounter with various wrathful and blissful deities, fights with demons, contact with ancestors, identification with different animals, extrasensory perception, astral projection, and particularly reliving of what appears to be past incarnation memories.

Detailed phenomenological analysis of the content of LSD sessions of a larger number of individuals reveals a fascinating fact. Not only do these sessions contain general experiential matrices and sequences that are identical to those found in eschatological mythology, rites of passage, and death-rebirth mysteries, but these are frequently expressed in terms of specific symbolism of certain culture areas. Thus, the experiences of heaven, hell, or Judgment of the Dead in European and American subjects do not necessarily follow the canonic rules of the Judeo-Christian religious tradition, as one would expect. On occasion, unsophisticated subjects described for example, detailed sequences from Hindu, Buddhist, and Jain mythology, or complex scenes from the little-known Egyptian Book of the Dead showing the fights of the crew of the solar barge with its specific enemies in the darkness of the Tuat. Parallels and some of the experiences with the Tibetan Bardo Thodol are so striking that in the mid-sixties Leary, Alpert, and Metzner recommended the use of this sacred text as a guide for psychedelic sessions. Similarly, the death-rebirth sequence can be experienced by some subjects in a Biblical framework as identification with Christ's suffering, death on the cross, and resurrection. Others, however, tend to identify at this point with Osiris, Dionysus, or victims sacrificed to the Aztec Sun God Huitzilopochtli. The final blow mediating the ego death can be also experienced as coming from the terrible goddess Kali, from Shiva the Destroyer, from the Bacchants, or the Egyptian Set. In all instances there can be quite detailed, accurate and specific symbolism of that particular cultural framework attached to the experience. The sophisticated structure of such sequences transcends on many occasions the educational background and training of the experiencer and the nature and origin of the manifested information remains a mystery. To follow Jung's example and call these phenomena archetypal provides a nice label but does not solve the problem. Obviously, much work awaits in the future for all serious researchers interested in this area.

The far-reaching parallels between the experience of dying (and death) and LSD sessions can be demonstrated by describing an episode from the history of Dean, one of the persons dying of cancer whom we treated with psychedelic therapy. The specific details of his illness and his LSD treatment have been discussed earlier.

In an advanced stage of his cancer, Dean suddenly developed severe uremia. Several years earlier, one of his kidneys had to be surgically removed because it was attacked by malignant growth. At this point, the ureter of the remaining kidney became obstructed by infection, and Dean was developing symptoms of intoxication by his own waste products. The surgeons kept delaying the operation apparently questioning the meaningfulness of an intervention that would at best prolong Dean's life for several additional weeks.

After Dean had spent eight days in progressively worsening uremia, we received an urgent telephone call from his wife at five o'clock in the morning. That night, Dean had seen Stan in a dream and wanted to discuss an issue that he considered most important. We arrived at the hospital about an hour later; by that time Dean's condition had deteriorated considersiderably, and he appeared to be in a coma. He was surrounded by several of his relatives who tried to communicate with him; there was no reaction except for an occasional quite incomprehensible mumbling. It was apparent that Dean's death was imminent. While Stan was comforting Flora and the relatives, trying to help them accept the situation, Joan sat down by Dean's side and talked to him gently, using her own westernized version of the instructions from the Bardo Thodol. In essence, she was suggesting that he move toward the light and merge with it, unafraid of its splendor. At a time when everybody in the room seemed to have accepted Dean's death, a quite unexpected thing happened. In the last moment, the surgical team decided to operate; without forewarning, two male attendants entered the room, transferred Dean to a four-wheeler and took him to the operating room. All the persons in the room were shocked by what appeared to be a brutal intrusion into an intimate and special situation.

During the operation Dean had two cardiac arrests resulting in clinical death and was resuscitated on both occasions. When we visited him in the afternoon in the Intensive Care Unit (ICU), he was just recovering from anaesthesia. He looked at Joan and surprised us with an unexpected, yet accurate comment: "You changed your dress!" Unwilling to believe that somebody who was apparently comatose, correctly observed and remembered such a subtlety, we started inquiring about the nature of his experiences on the morning of that day. It became obvious that he correctly perceived the people present in the room, their actions and conversations. He even noticed that at one point tears rolled down Joan's cheeks. At the same time, however, he was involved in a number of unusual experiences that seemed to be unfolding on at least three levels. He listened to Joan's voice and responded to her suggestions. The initial darkness was replaced by brilliant light, and he was able to approach it and fuse with it. Simultaneously, he saw a movie on

Master Hofuku (Pao-fu)

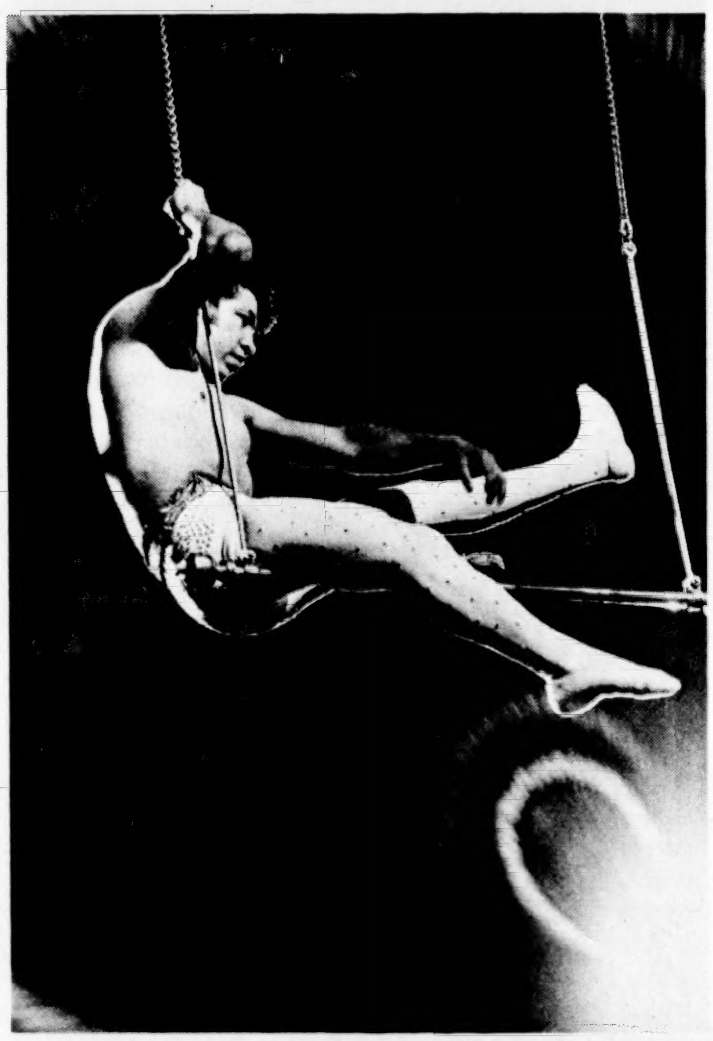
The master called his monks together and said, "During the last week my energy has been draining – certainly no cause for worry. It's just that death is near."

A monk asked, "You are about to die. What meaning does it have? We will continue living. And what meaning does that have?"

"They are both the Way," the master replied.

"But how can I reconcile the two?" asked the monk.

Hofuku answered, "When it rains it pours," and wrapping his legs in the full lotus, calmly died.



the ceiling, a vivid reenactment of all the bad things he had done in his life. He saw a gallery of faces of all the people whom he had killed in the war and all the youngsters he had beaten up as an adolescent hoodlum. He had to suffer the pain and agony of all the people whom he had hurt during his lifetime. While all this was happening, he was aware of the presence of God, who was watching and judging this life review. Before we left him that day, he emphasized how glad he was that he had had three LSD sessions. He found the experience of actual dying extremely similar to his psychedelic experiences and considered the latter excellent training and preparation. "Without the sessions, I would have been scared by what was happening, but knowing these states, I was not afraid at all."

Dean's experience is very important from the point of view of our discussion. It allows for more than a simple demonstration of the formal parallels between the situation of dying and the phenomenology of the LSD state. He was a person who actually experienced both states and could make a valid comparison on the basis of his own subjective experiences. His explicit statement about the deep similarity between his experience of dying and the LSD sessions only confirmed our own impressions, based on clinical observations in psychedelic sessions, study of anthropological and mythological literature, analysis of accounts of survivors of clinical death, and last but not least, on several situations similar to Dean's.

The above material clearly suggests that the human unconscious contains matrices for a wide variety of perinatal and transpersonal experiences that constitute the basic elements of the spiritual journey. The techniques and circumstances that can activate these matrices and transform their latent content into a vivid conscious experience, cover a very wide range. They involve psychedelic substances, sensory isolation as well as overload, sonic and photic driving, hypnosis, monotonous chanting and rhythmic dancing, sleep deprivation, fasting, various techniques of meditation and spiritual practice. On occasion, some pathological states will have a similar effect; this is true for severe emotional and physical stress, exhausting diseases, intoxications, and certain injuries and accidents. For reasons that are not clear at the present state of research, the perinatal and transpersonal levels of the unconscious become activated in naturally occurring psychoses, in particular schizophrenia and manic-depressive disorders.

In individuals who are dying, such unconscious matrices can become activated by many different mechanisms and combinations thereof. The specific triggers in individual cases will depend on the personality of the subject, his mental and physical condition, type of illness, and specific organs involved. We will briefly review in this context only the most obvious factors of this kind. The studies of Heim, Noyes, Rosen, and others have clearly demonstrated that a sudden confrontation with death can result in an unusual subjective experience even if the organism itself is intact. In this case, the only conceivable mechanism is psychological regression under the influence of severe emotional stress or shock. It is possible that a mitigated version of the same mechanism is also operating in individuals facing a less imminent prospect of death. In dying individuals there exists, however, a variety of deep organismic changes, many of which can function as triggers of unconscious matrices. Many diseases interfere with the proper nutrition and sleep of the patient and are associated with various degrees of starvation and sleep deprivation. Frequently inundation of the organism by toxic products is responsible for profound psychological changes. This is true especially in the case of hepatic and renal disease, since the liver plays an important role in the detoxification process of various noxious substances, and the kidneys eliminate the waste products of the organism. Mental changes are particularly profound when the individual suffers from a progressive involvement of the kidneys with subsequent uremia. A high degree of autointoxication can also result from disorders that are associated with disintegration of bodily tissues, as in cancer or wasting and degenerative diseases. Psychological concomitants of a physical disease are most easily understandable if the pathological process is affecting the brain; this occurs in patients with meningitis, encephalitis, head injuries, brain tumors, and other types of organic brain damage.

Anoxia, insufficient supply of oxygen to the tissues of the body, is of such paramount significance as a trigger of unconscious matrices that it deserves a more detailed discussion. In dying individuals, anoxia is an extremely frequent condition. It can be caused by processes in the lungs reducing the degree of oxygen intake (emphysema, pulmonary tumors, pneumonia, tuberculosis, and others), by inadequate distribution of oxygen such as in the case of anemias and cardiac failure, or by interference with the enzymatic transfer of oxygen on a subcellular level. It is well known from many different sources that a limited supply of oxygen or an excess of carbon dioxide produces abnormal mental states. Experiments with the anoxic chamber have shown that lack of oxygen can induce unusual experiences quite similar to LSD. McFarland has demonstrated that the psychosomatic reaction to anoxia is directly related to the pre-experimental personality of the subject. Neurotic persons have a much lower

tolerance to the situation and tend to respond quite early with difficult psychosomatic symptoms. His findings show far-reaching parallels with the results of LSD research. In 1950, Meduna published his book on the therapeutic use of carbondioxide in emotional disorders. The so-called Meduna mixture containing seventy percent oxygen and thirty percent carbondioxide can produce after brief inhalation the whole range of experiences known from LSD sessions. The similarity is so close that this mixture can be used as a prognostic tool before LSD sessions; the nature of the subject's reaction to carbon dioxide predicts quite reliably the response of that person to LSD. It can also be used before the session to acquaint a subject with the unusual states of mind that he will experience under LSD, or after the LSD experience to work through residual problems that remained unresolved in the session. Maneuvers restricting the supply of oxygen have been widely used through ages in the process of inducing unusual experiences. Thus, certain aboriginal rituals involve suffocation by mechanical means near drowning, or inhalation of smoke. According to some sources, the original form of baptism involved a forced situation of near drowning resulting in a profound death-rebirth experience.* Pranayama, an Indian spiritual practice based on the science of breath, uses periods of hyperventilation alternating with prolonged withholding of breath to induce spiritual experiences. Other Indian techniques involve obstruction of the larynx by the tongue twisted backwards, constriction of the carotid arteries, or prolonged suspension by the feet with ensuing long-term congestion of the blood in the head and brain anoxia. The Taoists advocate a technique of breathing during meditation where the intake of air is so slow and inapparent that a tiny feather placed in front of the nostrils remains unmoved.

It is possible that the similarities between LSD experiences and subjective concomitants of anoxia are more than accidental. Many hypotheses have been developed to explain the pharmacological and biochemical effects of LSD. There exists laboratory evidence indicating that LSD might interfere with the transfer of oxygen on the enzymatic level. Abramson and Evans who studied the effects of LSD on Siamese fighting fish (Betta splendens), described a variety of specific vegetative, motor, and behavioral responses to the drug in these animals. The fish responded by increased pigmentation and caricature-like postures and movements; the authors gave special names to some of these phenomena, such as the "Cartesian diver," "barrel-roll," and "trance-like" effect. In a separate study, Weiss, Abramson, and Baron obtained similar effects using two inhibitors of tissue respiration, potassium cyanide and sodium azide, in nonlethal concentrations; some of these phenomena could be also induced by anoxia and asphyxia. Although direct laboratory evidence concerning the inhibitory effect of LSD on tissue oxidation is controversial and inconclusive, the possibility of such effect is extremely interesting from the point of view of our discussion.

We have already mentioned that anoxia is rather frequent in dying individuals. Thus, in the study conducted by Karlis Osis on deathbed observations of medical doctors and nurses, anoxia was described most frequently by the attending physicians as the explanatory principle accounting for visions, apparitions, and other unusual experiences. If lack of oxygen and excess of carbon dioxide can produce effects similar to LSD, then a combination of these factors could be responsible for some of the unusual experiences accompanying and following clinical death. In those instances where death is caused by the cessation of the heart-beat, the tissues of the body can survive a certain time using the oxygen present in the blood and turning it into carbondioxide. In the case of brain cells, this situation lasts for about ten minutes before irreversible damage occurs. It is conceivable that the brain processes at this time have their conscious concomitants. If we believe that consciousness is associated with subcortical areas of the central nervous system, then this time period would be even of greater duration since the cellular elements in more archaic parts of the brain are less sensitive to lack of oxygen and can survive longer.

Under these circumstances, the deceased individual would experience what is called an altered state of consciousness similar to those induced by LSD or Meduna mixture. Activation of psychodynamic, perinatal, and transpersonal matrices in the unconscious could result in experiences of life review, divine judgment, hell, purgatory, heaven, or other elements of the posthumous journey of the soul as depicted in various traditions. One more issue deserves consideration in this context, namely the problem of objective and subjective time. The person in an unusual state of consciousness experiences time in a way that is quite different from our everyday perception of clocktime. During several minutes of objective time, persons under the influence of LSD can subjectively experience entire lifetimes, centuries, millenia, or even aeons. Similarly, a dying individual can relive his entire life within several seconds, and within minutes of clocktime he can experience an entire cosmic journey. Under these circumstances, one hour can be perceived as a second and one split-second can become eternity. Here the psychology of unusual states has to wait for its Einstein to construct the equations that govern these extraordinary transformations between objective and subjective space-time.

The most obvious objection against this concept is the alternative that is usually taken for granted – instant and permanent loss of consciousness at the time of clinical death,

*An anecdotal description of the interaction between a guru and his disciple can be mentioned in this connection. The guru holds the disciple's head under water for an excessive period of time and lets him surface only after repeated desperate signals. While the disciple, blue in his face and his eyes popping off his head, is gasping for breath, the guru asks him: "Do you want knowledge or air?"

comparable to that occurring during general anaesthesia or following a brain concussion. The subjective accounts of survivors of clinical death indicate that there might be more than one alternative. Since the loss of consciousness under the influence of a general anaesthetic is so frequently considered to be a model of the situation occurring at death, this issue deserves a special comment. Interesting observations regarding general anaesthesia can be mentioned here to show the complexity of the problems involved. In the so-called dissociative anaesthesia induced by ketamine (Ketalar), patients experience a variety of unusual states of mind while they appear to be unconscious for an external observer. Operations performed in this condition are possible not because consciousness is extinguished, but because it is drastically refocused. In our own psychedelic research, LSD subjects have occasionally relived all the sensations from operations performed under deep anaesthesia of a conventional type. In other experiments, patients were capable of reconstructing under the influence of hypnosis the conversations of the surgical team during an operation that had been conducted with the help of general anaesthetics.

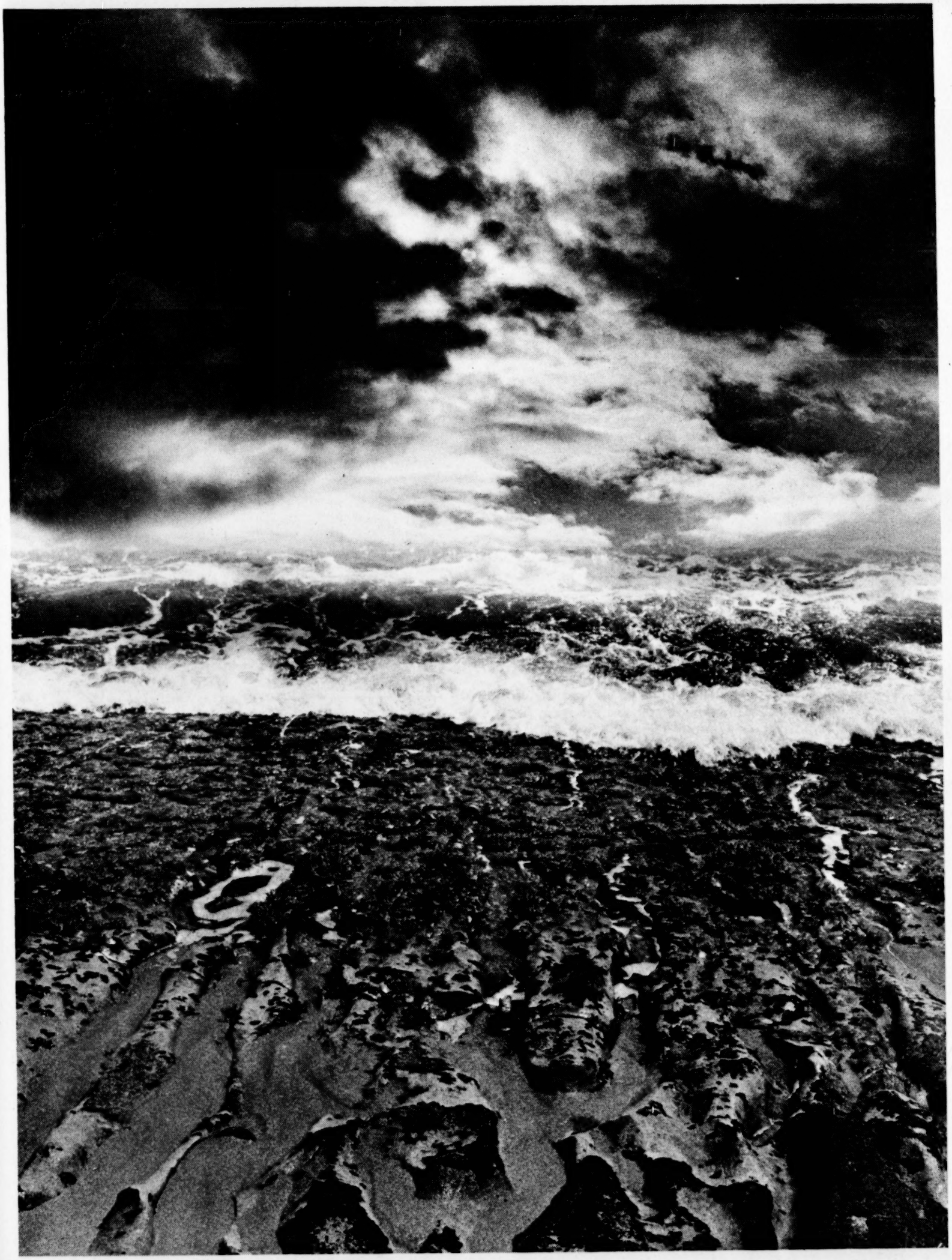
If there is a reasonable possibility that the experience of dying might be a complex process, at least as complicated and ramified as life itself, the efforts invested in antiquity and in aboriginal cultures to this issue suddenly appear in a new light. In view of the psychological relevance of this event, it certainly makes sense to learn as much as we can about the process of dying, familiarize ourselves with the maps of the posthumous journey, and, if possible, obtain practice and adequate training in the unusual states of consciousness that it entails. Many non-Western cultures have occasions on which their members get acquainted with unusual states of consciousness. In others, the death experience is regularly rehearsed within the framework of rites of passage. In our world, death takes the individual by surprise and finds him for the most part totally unprepared.

Specific procedures that make it possible to experience profound sequences of psychological death and rebirth and other perinatal and transpersonal phenomena might be, however, more than just training and preparation for the final transition. There are indications that such experiences which the individual has during his lifetime actually modify the way in which he will die, in other words, can alter his actual death experience. It seems that some of the struggle and agony that is associated with the process of dying in some persons is due to the fact that the physiological and biochemical changes in the organism activate various difficult unconscious matrices. Thus, at least part of the agony of dying might be related to unresolved conflicts from the individual history and to the reenactment of the agony of birth that has not been worked through and consciously integrated. An important observation from LSD psychotherapy can be mentioned to support this possibility. In patients who have had serial LSD sessions, the earlier LSD experiences usually contain much psychodynamic material and dramatic perinatal sequences. If the sessions continue, these areas can be completely worked through and all subsequent sessions are of a transpersonal, religious, and mystical nature. When these patients are given inhalations of Meduna mixture in the course of their LSD therapy, their response to carbondioxide will change depending on the stage of LSD treatment. In the free intervals between early LSD sessions, this mixture will evoke visions of abstract geometrical patterns and reliving of childhood memories. The same combinations of gases administered later, at a time when these patients are working on the perinatal material, will trigger sequences of the death-rebirth struggle. In the advanced stages of psycholytic treatment when the LSD sessions are predominantly transpersonal in nature, the inhalation of Meduna mixture will induce transpersonal phenomena — various mystical and religious states, archetypal elements, or even past incarnation experiences. Some direct evidence indicating that psychedelic sessions can change not only the concept of death and the attitude towards it, but the very nature and content of the experience of dying, comes from psychedelic therapy of persons dying of cancer. All the observations described above seem to support the point of view so clearly and succinctly expressed by Abraham a Sancta Clara (1644-1700), an Austrian Augustinian monk. "The man who dies before he dies, does not die when he dies."

The present difficulties in administering psychedelic therapy naturally raise the question of the practical relevance of the above discussion. Since the major objections against professional use of LSD and other psychedelics are of an emotional rather than scientific nature, it is difficult at this point to predict the future of LSD therapy. The work with psychedelics has, however, made it possible to map this new territory, realize the nature of the problems involved, and discover certain new relevant mechanisms in the therapeutic approach to this area. At the present time, many individual researchers are trying to develop non-drug alternatives to psychedelics based on the same general principles.

It is not necessary, however, to wait for the relegalization of LSD therapy or the development of new powerful non-drug techniques for altering consciousness. Closer examination reveals that unusual states of consciousness, similar to those produced by LSD, occur spontaneously in many dying individuals for reasons of a physiological, biochemical, and psychological nature. At the present state of knowledge, such unusual states are usually considered psychiatric complications and are routinely suppressed by the administration of tranquilizers. According to our experience, a sensitive psychologist or psychiatrist can use at least some of these states constructively, in a way not dissimilar to an LSD experience. With adequate support and guidance, such episodes can prove to be very meaningful and beneficial for the dying individual. Such an approach necessitates, however, a dramatic shift in our value system from the emphasis on mechanical prolongation of life to concern about the quality of the death experience.

At the conclusion of this chapter, a few words should be said about the new relationship between religion and science that seems to be emerging from the study of unusual states of consciousness. At the present time, the prevailing feeling is that the discoveries and development of science have discredited the validity of religious beliefs. The basic concepts and assumptions of religions, if taken literally, appear naive, childish, and absurd to the sophisticated and scientifically minded. Astronomers have aimed gigantic telescopes at the sky and have systematically explored vast areas of the universe. There is no more uncharted space left for celestial spheres, hierarchies of angels, and God himself. Geological and geophysical research have established the structure and composition of the crust and core of the earth and found no traces of hell. What was attacked and discarded by contemporary science, however, is a primitive and naive belief that the basic religious concepts have an objective existence in the three-dimensional physical universe as we experience it in usual states of consciousness. The observations from LSD research clearly indicate that in various special states of mind the bliss of paradise, horrors of hell, and ecstatic raptures of salvation can be experienced with the degree of vividness and sense of reality that matches or even surpasses our everyday perceptions. The matrices for these experiences and a whole range of other religious and mystical phenomena appear to be an intrinsic part of the human personality. Recognition and exploration of these dimensions is thus indispensable for a deeper understanding of human nature. ■



Box 428, Sausalito, California 94965

New Swimming

BY ROSEMARY MENNINGER

Rosie, 27, is chief co-evaluator of garden and agriculture books for the EPILOG and CQ (co- with Richard Nilsen). Her main work currently is organizing urban community gardens in San Francisco. Her prime secondary interests, swimming and sewing, also make their mark in this issue.

– SB

New swimming, like new math, is a disconcerting thought – when you've already learned how to swim, why find out that you do it all wrong?

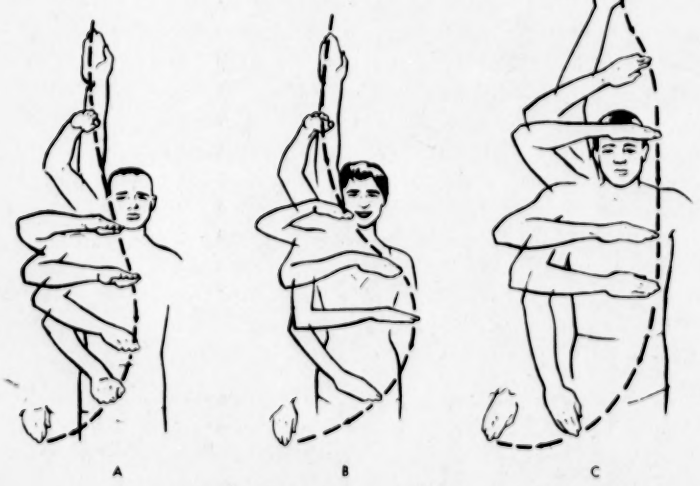
It is a clumsy transition, but think of a flying fish skimming over, not through, the water. Riding slightly higher and streamlined decreases the water's resistance around the body; and the liberation is an exhilerating surprise.

Much of the theory and dynamics of the new strokes were developed by James E. Counsilman, whose book, **The Science of Swimming,** lives up to its title. It is so well written and illustrated that you can actually learn the strokes by reading and practicing.

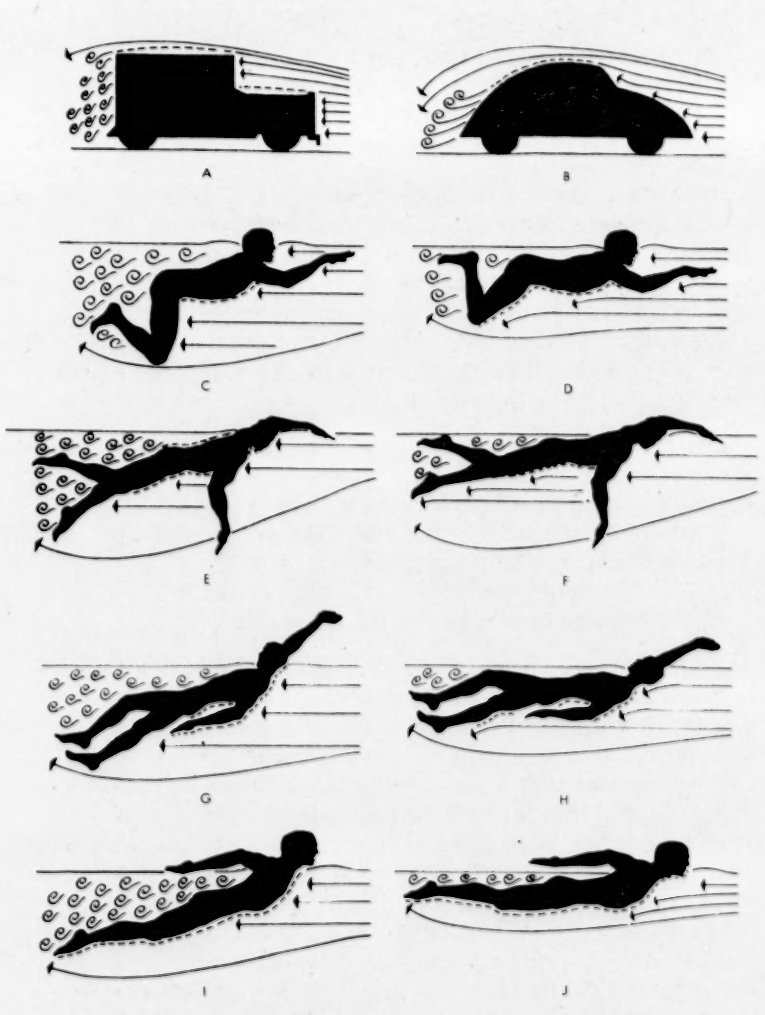
However, I was greatly helped by two other teachers – a lifeguard and my goggles. Small competitive swimming goggles allow you to watch yourself in the water, comparing your own stroke to what you saw in the book. That can give you a feeling for what's wrong. Then ask a swimming instructor to watch you for a lap – most public pools have at least one lifeguard qualified to teach – many of them now know the new strokes and won't mind giving a quick critique. I found that about half the time I couldn't translate the instructor's advice into motion. But every so often he'd hit upon a metaphor, or just say the same thing one more time, and it made sense; it would even make a difference.

It's easy to work on several new strokes at once (a few minutes each of crawl, back crawl, and breaststroke) because the same principles apply. One is that pulling is more efficient than pushing. The old windmill circles the arms did in the front crawl pushed us down in the water as much as pulling us forward. The flutter kick that was supposed to be pushing us from behind has been shown only to contribute balance and bouyancy. While the arms were pushing us down, the flutter kick did counter by keeping us afloat, but the only propulsion was from the first quarter circle after the arm hit the water.

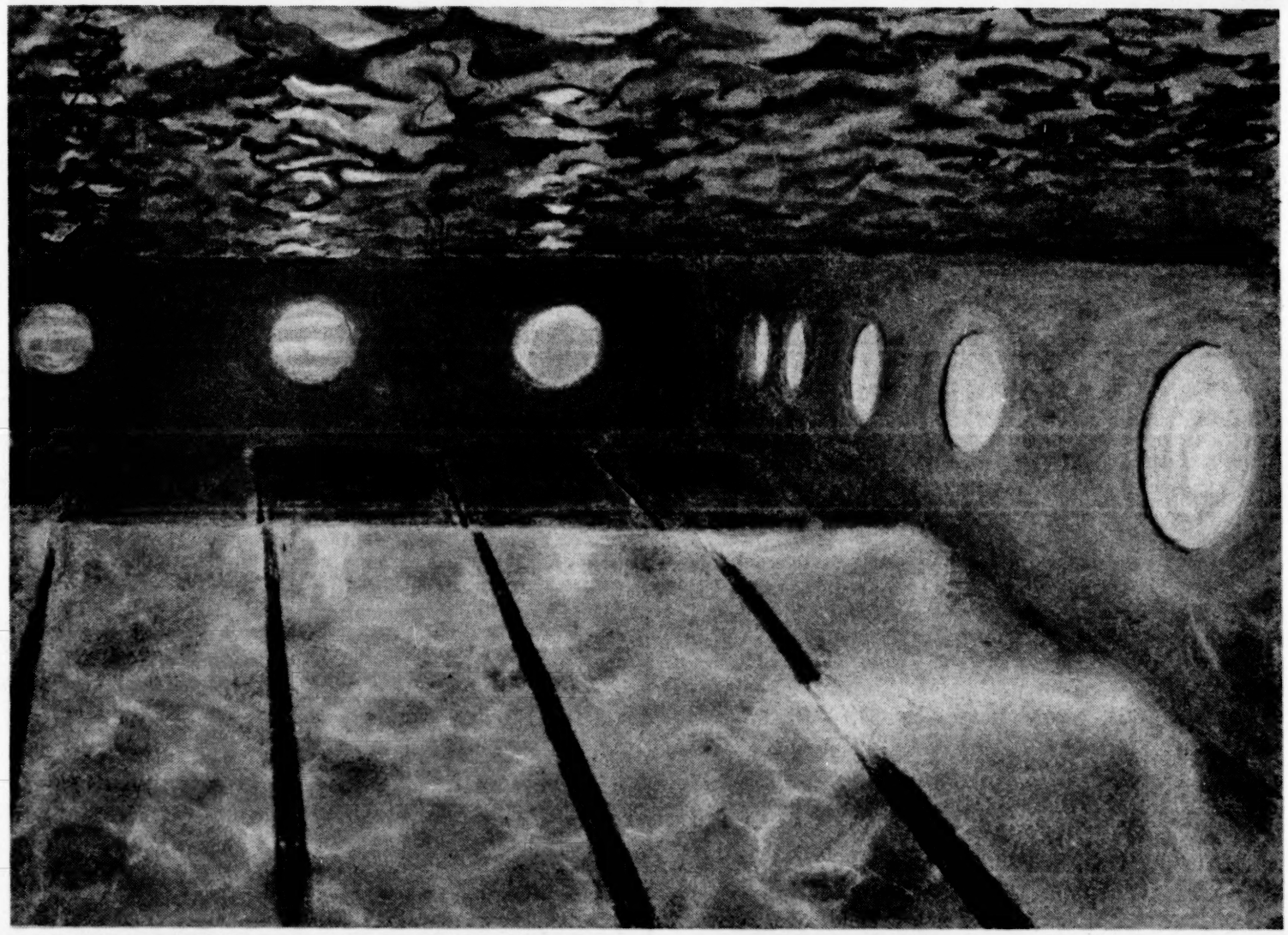
All this made sense to me when the lifeguard tied a towel around my ankles to prevent kicking, then had me swim the crawl. I recommend this, because to keep from drowning you have to start pulling, and it feels entirely different. It even uses different muscles – ones that make good arm wrestlers. After a few laps untie the towel, add a slow kick, and spend the next few months strengthening and streamlining the motion until you get that flying fish feeling. It makes it all worth while.



The Pull Pattern of Three Champion Freestyle Swimmers



POOR STREAMLINING GOOD STREAMLINING



The goggled swimmer's view of Rossi Pool in San Francisco. Pastel by Rosemary Menninger.

I believe the new strokes may contribute to a new wave of interest in swimming – for one thing, learning them gives you something to do in the water. Much of what people do while swimming either bores or embarrasses them: turning somersaults for instance ("Did anybody see me?"), or swimming laps (". . . 51 . . . 52 . . ."). Adults, especially in cities, swim in pools for intentional exercise; they expect, maybe even want, it to be dull.

For urban dwellers, there may soon become alternatives to the chlorinated cement pool. I dreamt one night of a golf course turned into a long swimming channel, winding up and down the fairways, under trees and among gardens. But the bathing Japanese have already built this in Tokyo: a slippery slide coming off the roof of one skyscraper down into a swimming pool on the roof of another.

The small plastic goggles I mentioned add a new dimension to swimming. Besides eliminating chlorine burn and most collisions, they treat you to a blue world where people move like dancers and shimmering light makes cement seem soft. Self-styled meditation goes well with swimming laps, if you don't count. The mind fades; the body takes over; and the eyes may close. With practice, it is possible to keep the eyes open for oncoming swimmers and yet not feel distracted by seeing. Hatha yoga is a helpful out-of-the-water exercise, because the muscles that swimming contracts and strengthens, yoga stretches. Practicing yoga is about the only way a person over 25 can master the butterfly stroke. The butterfly's dolphin kick requires a very limber back, but has the advantage of being one of the only swimming motions that imitates and feels like a fish.

Even five minutes of swimming will benefit most muscles. However, to really rev up the whole body you'll need to build some stamina, and that depends more than anything on proper breathing. Start by swimming a few minutes non-stop until you want to rest. This is easier if you remember that exhaling is more important than inhaling. To get rid of the CO_2 fatiguing muscles build up, push out what feels like a lung-full of air before taking in a mere mouthful. A feasible goal can be 20 minutes non-stop, which is enough to increase circulation and strengthen the heart.

Competition has so long been the king of reasons for swimming that I'm tempted to pooh-pooh it. Actually, like perfecting stroke mechanics, racing is another interesting thing to do. Spontaneous competition can be wonderful; and if you swim fairly often, it happens fairly often. One day while swimming laps, I was aware of a teenage girl showing off by imitating the little kids who couldn't swim . . . I thought she was obnoxious and kicked up a lot of water as I swam past her and her friends. All of a sudden she was swimming beside me and, not wanting to be passed, I sped up until we were swimming all out neck and neck for six laps. I pulled up exhausted, and in the instant that we caught each other's eyes, before she turned and swam slowly back, we had settled the argument with both of us winning.

One of Counsilman's more famous theories is that serious competitive swimming requires not only a tolerance, but a fondness, for physical agony. Masochism seems to play an important role in swimming for many people. A sizable group in San Francisco swim daily, year-round in the icy Bay. Most keep a layer of fat on themselves for insulation and

Box 428, Sausalito, California 94965

enjoy the challenge of various weather conditions, as well as the view. They ignore the pollution, become accustomed to the cold, and several claim they feel weak and sweaty in a regular pool.

I agree that the horror of frigid water is glorious. Coupled with outdoor surroundings, it can be a swimmer's dream: a crater lake, a vast reservoir, or swimming against the current in a large irrigation ditch. But long-distance swimming requires safety precautions. A friend with a canoe is, of course, ideal; almost as safe is a friend on a board or sturdy air mattress for life raft. Swim half way then switch places. The "paddle" that surfers do prone on their boards greatly strengthens the muscles used in the crawl; so even the paddler is getting a swimming workout.

Mark Spitz certainly didn't do for swimming what Billie Jean King did for tennis. But from my view in the locker room, a major factor already contributing to swimming's growth is healthy vanity. Men and women are enjoying their bodies more. For women, there has been an even bigger change: a change of hairstyle. Eight years ago, most women who liked swimming didn't swim for the sole reason that they'd have to reset their hair. The present wash 'n dry hairstyles may have done more than anything else toward equalizing the sexes in the water. Now more young and older women are becoming better, stronger swimmers. ■

The Science of Swimming
James E. Counsilman
1968; 446pp.
$10.50 postpaid
from:
Prentice-Hall, Inc.
Box 500
Englewood Cliffs, N.J. 07632
or Whole Earth

Some Principles in Developing
Muscular Strength and Endurance

The statement of a few principles may help the reader understand better how to design a dry land exercise program in such a way as to receive maximum benefits from it. The first two of the following principles concerning progressive resistive exercises are known as DeLorme's principles.

1. Strength is built in a muscle by the use of high resistance-low repetition exercises, such as by five to ten repetitions of a supine pullover with a weight of 50 to 75 pounds.

2. Endurance is built in a muscle by the use of low resistance-high repetition exercises, such as by doing 300 or more repetitions of the same exercise as above with a weight of 15 to 25 pounds.

At this point a third principle not mentioned by DeLorme may be added:

3. Exercises that use moderate resistance and moderate numbers of repetitions, such as doing the same exercise as above with 35 repetitions and a weight of 35 pounds, build some strength, although not as much as the first type of exercise, and some muscular endurance, although not as much as the second type.

Once the type of exercise or stress to be placed on the muscle has been decided, to a great extent the quality to be built in the muscle has also been decided. This again is an example of the specificity of training.

My 27 favorite things

warmth
learning
silence
people with enough courage, compassion & energy to assume responsibility for their world & try persistently to help
plants, wherever they grow—— in forests, parks, yards & windows—— watching, smelling, gathering, gardening & leaving them alone
healthy breathing
news—— of interpersonal & international reconciliation
of bountiful harvests widely shared
of the discovery of effective cures for dread diseases
music
editing film with music
communicating thoroughly and personally with someone, especially being close to a human female, touching, talking, working together, reading to each other, giving & receiving true messages & thorough massages
herb tea—— especially peppermint, comfrey, borage, chamomile, passionflower, wintergreen, ginseng and mu
occasional marijuana or hashish
having a helpful clear idea
outdoor walking and sitting
orgasm
vegetarianism
visitors from outer space
cleaning up and recycling
colors
corn bread (made with corn meal, millet flour, wheat germ, soy flour, maple syrup, sesame oil, coriander and nutmeg)
sounds other than those made by machines, people, catastrophes and dogs: sounds such as of wind, rain, rivers, oceans, forest tree sways and leaf drops
urinating
right livelihood: working at something I believe in & want to do, fixing something that needs fixing
a little wine sometimes, mixed with apple juice
sleep
freedom
having more time

Paul Butler
San Francisco

Infinite space

We've had unusual response to a letter we printed in the Winter CQ from Gordon Solberg, asking if other people had experienced the 3-D universe as he did one time. Here's one.

— SB

Dear CQ,

This in (perhaps oblique) reply to Gordon Solberg, who wrote about sensing the universe as three dimensional.

Here is a little experiential exercise which has often teased me into a flash of perceptual restructuring. I've done it since I was a kid, from time to time, but can't remember how the idea first came to me:

Lie on your back outside, spread out like a rug in a large open space, so that you are as much surrounded by stars with as little intrusion of horizon as may be. Then imagine yourself at such a vantage point in space that you see the earth as a sphere, darkly rotund against a background of stars, with a top and bottom. Imagine yourself lying on your back on the bottom of this ball, staring down into infinity. If you can achieve the merging of these two imaginings — the earth in space, and yourself sticking to the bottom of it — it should produce a jolt. Keep the idea of gravity steadfastly in mind and it won't be too scary.

I've had a related experience, sporadically, unwillingly, since I was very little, touched off by hearing in Sunday School that the universe is without end. I happened to think of this one night while I was lying in bed, and I began to consider just what this statement might mean. I sent my mind hurtling through space, away and away from the earth out toward the edge, past suns and dust clouds, looking for the end. (I rather expected a brick wall.) But "infinite" meant "without end", and so I kept going and going until suddenly I realized that "infinite" meant NO END, EVER!, and with that I felt a billow of fear ignite like a match before an aerosol spray. I jumped up and ran to the door, and the finitude of the doorknob in my gripping hand pulled my imagination back from endless nothing to the world of little girls.

Scared me. It happened again about a week later — my mind was sucked out in an irrestible effort to comprehend the incomprehensible. This time I got so frightened that I ran all the way into the living room and into my mother's lap where I squeaked "Mommy, I'm scared!", before I felt that I had safely returned from the dissipation of a universe with no edge.

I knew perfectly well that I was not "really" travelling in space, that all along I was lying in my own safe bed. But just the attempt to entertain, feelingly, the mere idea of infinity would generate, after about three imaginary leaps outward, a spontaneous combustion of chilly fear, pervasive, intolerable, unlike any other fear I've ever felt.

After that I tried like hell to avoid the whole thing. When I felt it coming on I would jump up and down on the bed, or pull my pajamas tight around my waist, anything to produce intense physical sensation — "I have a body, and it is finite!"

Then the bastards told me that I would live forever, and made my bottomless pit two-dimensional — now I'd have plenty of time to look for the wall that wasn't there. I didn't want to live forever!

But I got pretty good at spotting and skirting the beginning of the process, and after a while it stopped sneaking up on me, didn't present itself for several years.

I can still do it, when I muster enough concentration. Grown elderly and philosophical, I've brought it on several times in order to explore the nature of my imaginings and, especially, the odd fear. "It can't scare me this time, I'm a big girl."

Ha. Each time is exactly like the first — after a certain period of travel my soul shrieks, "I am lost!", the icy spray of fear washes every cell in my body, and my hand slams down on the table, POW! "There is my fist!"

And despite the peremptory thud, the return is not instantaneous. There's a time lag, a sluggish shrinking before I can fit again inside my skin because, after all, even though I'm earthed again, contained, it's still out there — or not out there . . .

Let it be explicit that this is no cybernetic vision, no merging of the self with the encompassing All. Indeed, it's no vision of the universe at all, for I go beyond the universe, outside to the farthest reaches of . . . nothing. It's the endlessness that sears, the emptiness, the knowing that I could go on and on and on and on, and then go on and on and on and on. Maybe the shock is due to my mind finding itself in an environment not merely hostile but irrelevant, a finite entity trying to encompass infinity, the terms of which are contradictory to the very existence of the entity. I dunno.

I've told people about this, but nobody I've talked to has been there. Surely it's not just me. Anybody else?

And I have another question: How does it happen that there's something, instead of nothing?

— Judith Van Slooten
Santa Cruz, California

Bargain Ram Dass

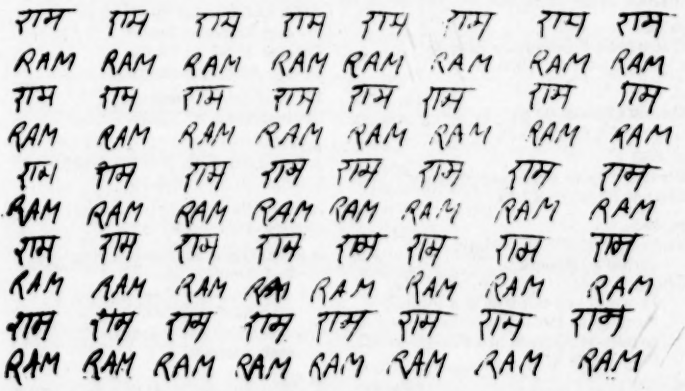
Those who read **Be Here Now** or **The Only Dance There Is** will already know "Ram Dass' amazing awareness." His calm clarity and humor are heightened when the voice is added. Cassette recordings of his lectures are available at $1.50 per cassette hour. They have been used to cool out over-anxious mothers, inspire nurse's aids, in rehabilitation programs, classrooms and yoga classes but primarily they are helpful for one who is trying to integrate his or her own life and spiritual understanding.

Over 75 lectures totalling over 150 hours are available. Among these are a few tapes of music recorded at the lectures. Better quality music recordings in stereo will soon be offered. As well as Ram Dass tapes the Hanuman Tape Library offers recordings of instruction in Southern Buddhist Vipassana meditation taught by Joseph Goldstein.

In order to discourage buying the cassettes with the intent of recording over them, blank cassettes are sold at the same price as recorded ones. The cassettes are Magnasonic by Audio Magnetics. They are screwed together so you can easily open and fix them if they get jammed and it seems that in comparison to the finest and most expensive cassettes "99.9% of the time there would be no audible difference."

peace and Jai Hanuman!
Dwarkanath

The Apocalypse ?



Catalog free from:
Hanuman Tape Library
P.O. Box 4129
Boulder, CO 80302

Dwarkanath was Joe Bonner and 17 when he pasted up the entire first WHOLE EARTH CATALOG in 1968.

— SB

Updated The Last Whole Earth Catalog

Changes

These changes plus the ones in the Winter '74 CQ will bring your "Updated" LAST WHOLE EARTH CATALOG (13th, 14th or 15th printing, or the hardcover) all the way up to date – February 1975.

– SB

p. 5
The Hubble Atlas of Galaxies
Change $10.00 to **$12.50**

p. 7
NASA Earth Photo Books
Ecological Surveys from Space
Change "[Suggested by Frank Rowsome, Jr.]" to **Suggested by Frank Deis**

p. 9
Man's Domain
Change $3.95 to **$4.95**

p. 14
On Growth and Form
Change $4.95 to **$5.95**

p. 31
Man Adapting
Change $3.75 to **$4.95**

p. 58
Oak Ridge Herb Farm
Defunct

p. 62
General Viticulture
Change $16.50 to **$27.50**

The Cultivator's Handbook of Marijuana
Change $2.00 to **$3.00**

p. 70
Sanitation Manual for Isolated Regions
Change "free" to **$1.00**
Change "from: Department of National Health and Welfare, etc."
to **Information Canada Bookstores**
800 Granville Street
Vancouver, British Columbia
393 Portage Avenue
Winnipeg, Manitoba. R3B 2C6
221 Yonge Street
Toronto, Ontario
171 Slater Street
Ottawa, Ontario K1A 0S9
640 St. Catherine St. West
Montreal, Quebec
1683 Barrington Street
Halifax, Nova Scotia

p. 73
Prospecting and Operating Small Gold Placers
Change $6.95 to **$7.75**

p. 80
Wild Edible Plants of the Western United States
Change $3.95 to **$4.50**

p. 82
Design With Nature
Change $5.95 to **$6.95**

p. 86
Shelter and Society
Out of Print

p. 87
Structural Design in Architecture
Change $15.00 to **$15.95**

p. 89
Culture Breakers, Alternatives, and Other Numbers
Change "MSS Educational Publishing Co., Inc."
to **MSS Information Corporation**
655 Madison Avenue
New York, NY 10021

p. 98
Wiring Simplified
Change $1.00 to **$1.79**

p. 122
Technology and Change
Out of Print

p. 128
The Starrett Book for Student Machinists
Change $2.90 to **$3.25**

p. 144
How to Work with Tools and Wood
Change $1.25 to **$1.50**

p. 148
The Wheelwright's Shop
Change $3.75 to **$4.95**

p. 150
Frontier Living
Out of Print

Colonial Living
Out of Print

p. 151
Traditional Country Craftsmen
Out of Print

p. 153
The Book of Tea
Change $1.00 to **$1.25**

p. 159
The Japanese Art of Miniature Trees and Landscapes
Change $10.25 to **$10.95**

Business

Whole Earth Epilog

Changes

These changes plus the ones in the Winter '74 CQ will bring your EPILOG (1st or 2d printing or the hardcover) to February 1975 currency.

– SB

p. 453
Steps to an Ecology of Mind
Change $1.95 to **$2.25**

p. 455
Cybernetic Problems in Bionics
Change $54.00 to **$64.75**

p. 459
Goode's World Atlas
Change $4.95 to **$6.95**

p. 462
Perspectives in Ecological Theory
Change $5.50 to **$2.45**

p. 465
Toward Global Equilibrium: Collected Papers
Change "(Vol. III will be called The Dynamics of Growth in a Finite World)" to **(Vol. III is The Dynamics of Growth in a Finite World, $35.00).**

p. 475
Face of North America
Change $2.45 to **$2.95**

p. 476
Kitchen Magic With Mushrooms
Add **$3.95 while they last**

How to Identify Mushrooms
Change $3.80 to **$3.50**

p. 478
Peterson Field Guides
A Field Guide to the Birds (Eastern N.A.)
Change $5.95 to **$4.95**

A Field Guide to Western Birds
Change $5.95 to **$4.95**

A Field Guide to the Birds of Texas and Adjacent States
Change $5.95 to **$8.95**
Delete **All $5.95 postpaid**

Birds of North America
Change $4.50 to **$3.95**

p. 479
A Field Guide to Animal Tracks
Change $5.95 to **$4.95**

A Field Guide to the Mammals
Change $5.95 to **$7.50**

A Field Guide to Western Reptiles and Amphibians
A Field Guide to Reptiles and Amphibians (Eastern N. America)
Change $5.95 each postpaid to **$4.95 each postpaid**

p. 486
Community Water Systems Source Book
Change $7.50 to **$8.50**

p. 487
Waterless Toilets
Change to **Waterless Sewage, Treatment for the Home**

Clivus-Multrum USA
Change "Cost is $1,600 plus toilet (about $60) plus chutes." to **Cost ranges from $600 to $1300 depending on size, parts and circumstance.**

p. 492
The Nature and Property of Soils
Change $11.95 to **$13.95**

p. 497
Ginseng and Other Medicinal Plants
Change $4.00 to **$4.50**

The Marijuana Farmers
Change $2.95 to **$2.75**

p. 500
Biological Control
Change $4.50 to **$5.50**

p. 501
Growing Vegetables in the Home Garden
Change $.75 to **$.80**

p. 502
Bio-Dynamic Literature List
Change "Biochemical Research Laboratory, etc."
to **Bio-Dynamic Literature**
P.O. Box 253
Wyoming, RI 02898

p. 509
Design & Color in Islamic Architecture
Change "Random House, etc."
to **Smithsonian Institution Press**
c/o George Braziller, Inc.
One Park Avenue
New York, NY 10016

p. 511
American Building
Change $12.50 to **$15.00**

p. 513
Early Domestic Architecture of Connecticut
Change $4.00 to **$4.50**

p. 517
Pole Building Construction
Change "Pole Building Construction, etc."
to **Low Cost Pole Building Construction**
1974; 112pp.
Change $3.00 to **$4.50**

p. 518
Heat Saver
Defunct

Riteway Wood and Coal Heaters
Change $261 to **$295**

p. 520
Woodwork Joints
Change $5.50 to **$3.95**

p. 523
Tipi Poles
Change "Cost 25 cents per foot (20' pole = $5.00)" to **Cost 40 cents per foot (20' pole = $8.00).**

Tipi Makers
Booklet – change 75 cents to **$1.25**

p. 525
Lo Tech Air Domes
Change "Price unknown, write for details" to **$5.00 postpaid**

p. 529
Solar Heating, Cooling, and Energy Conservation Directory
Change "400 pp." to **500 pp.**
Change Carolyn Pesco to **Carolyn Pes Pesko**

Economics of Solar Collectors, Heat Pumps and Wind Generators
Change $1.40 to **$1.90**

p. 530
Sol-Therm Water Heater
Change $595.00 to **$695.00 (2 x)**

SAV Solar Water Heater
Change zip code 91401 to **91411**

p. 533
Solarex Solar Energizer
Solarex Unipanel
Change $75.00 to **$69.00**

p. 534
Intermediate Technology Publications
Journal of Appropriate Technology
Change "£3.50, etc." to **£4.50, U.S. $10.50 airmail**

Health, Manpower and the Medical Auxiliary
Change "£2.00, etc." to **£1.90, U.S. $4.40 airmail**

p. 535
Integrated Living Systems
Change name to **Integrated Life Support Systems Laboratories**

p. 537
Wind Dynamo
Add **Info Packet $5.00 from Willard D. Gillette, etc.**

p. 165
The Techniques of Rug Weaving
Change $17.50 to **$19.95**

p. 169
Looms from Sweden
Add Exclusive U.S. Distributors for Gunnar Andersson
Berga/Ullman Inc.
P.O. Box 831
Ossining, NY 10562

p. 184
Accounting for Everyday Profit
Out of Print

p. 206
American Go Association
Change "Box 41, etc."
to American Go Association
P.O. Box 397
Old Chelsea Station, NY 10011

p. 211
How to Live with Schizophrenia
Change $5.95 to **$8.95**

p. 214
First Aid
Change $1.00 to **$1.50**

p. 220
Swedish Milk Cups
Change $6.25 to **$6.78**

p. 223
A Manual of Death Education and Simple Burial
Add Also available from
Continental Assoc. of Funeral & Memorial Societies, Inc.
Suite 1100
1828 L St., N.W.
Washington, D.C. 20036

p. 233
Est – The Steersman Handbook
Out of Print

p. 248
Volkswagen Technical Manual
Change $3.50 to **$12.95**

p. 249
Western Distributors
Defunct

p. 254
The Way of the White Clouds
Out of Print

p. 257
Mountain Safety Research Newsletter
Change "free" to **$10 (makes you a supporting member)**
Add **Current issue free to prospective subscribers. Selected articles reprint of last eight issues – $1.75**

p. 259
Horses, Hitches and Rocky Trails
Change $4.00 to **$5.00**

p. 275
Outdoor Survival Skills
Change $2.95 to **$3.95**

p. 296
Weather Flying
Change $5.95 to **$6.95**

p. 305
Traveler's Directory
Change "Traveler's Directory, etc."
to Tom Linn, Editor
6224 Baynton St.
Philadelphia, PA 19144

p. 310
The Elements of Style
Change $1.25 to **$1.45**

p. 315
Physical Control of the Mind
Change $2.25 to **$2.95**

p. 319
The New Mathematics Dictionary and Handbook
Out of Print

p. 322
Cybernetic Serendipity
Out of Print

p. 324
The Radio Amateur's Handbook
Change $4.50 to **$5.50**
Change "$5.00 in Canada, $6.00 elsewhere" to **$6.00 in Canada, $7.00 elsewhere**

p. 336
Carroll Sound
Change "Carroll Sound Inc." etc.
to Carroll Sound Inc.
351 W. 41st St.
New York, NY

p. 338
Improvising Jazz
Change $2.45 to **$2.95**

p. 355
The Art of Color
Change $47.50 to **$48.00**

p. 356
The Natural Way to Draw
Change $6.95 to **$7.95**

p. 367
Playthings
Change "Galt Toys, etc."
to Galt Toys
63 Whitfield St.
Guilford, CT 06437

p. 369
Indian Tales
Change $2.65 to **$3.45**

p. 373
The Blue Fairy Book
Change $2.00 to **$2.75**

The Pink Fairy Book
Change $2.00 to **$2.75**

p. 379
Seedtime on the Cumberland
Out of Print

p. 380
American Boys Handy Book
Change $5.50 to **$7.50**

p. 382
Black Elk Speaks
Change $1.50 to **$1.75**

p. 392
The Practical Cogitator
Change $6.95 to **$8.95**

p. 394
Piaget for Teachers
Change $3.50 to **$3.95**

p. 395
How to Live with your Special Child
Change to Understanding Young People in Trouble
Change $7.50 to **$4.50**

p. 399
Puppetry Store
Defunct

p. 402
This Book Is About Schools
Out of Print

p. 407
The New Religions
Out of Print

p. 416
Psychological Exercises
Change $3.50 to **$1.95**

p. 425
Aikido and the Dynamic Sphere
Change $11.50 to **$12.75**

p. 427
The King and the Corpse
Change $2.95 to **$3.45**

Wind Generator Dealers
Real Gas and Electric Co., Inc.
Change "Quirk's" to **Dunlite**

Windmill Manufacturers
List is defunct

p. 538
Energy: Uses, Sources, Issues
Add order No. UCRL-51221

In the Making
Change "ITM, etc."
to ITM
221 Albert Rd.
Sheffield S8 9Q4
Yorkshire, England

p. 539
The Journal of the New Alchemists
Add Single copies: Journal #1 $4.00, Journal #2 $6.00

p. 542
Nalgene Labware
Change "Nalgene Dept. 4116C" to **Nalgene lab supply**

Duct Tape
Change "Duct Tape" to **Ductape**
Change $1.59 postpaid to **$1.69 plus 32¢ per pkg. postage (2" x 9.72 yds.)**

Aladdin Again
Change "Country Light" etc. to
P.O. Box 5142
Rome, GA 30161

p. 543
The Plastics Factory Catalog & Handbook
Change Catalog to **Catalog-Handbook $1.00**

p. 544
Heat Pipes
Change zip code 87106 to **87131**

p. 546
Access to Craft Books
Straw Into Gold
Add P.O. Box 2904 to address

Crafts for Today
Delete "or Whole Earth"

p. 550
Leather
Out of Print
Change Henry Regnery Company, etc.
to Henry Regnery Company
180 N. Michigan Avenue
Chicago, IL 60601

p. 551
Leather Tooling
Change $3.25 to **$3.00**

p. 552
Potworks
Change $2.45 to **$2.95**

p. 554
Ceramics Periodicals
Ceramics Monthly
Change "Subscriptions, etc." to Subscriptions: one year **$8.** Address Ceramics Monthly, **Box 12448**, Columbus, Ohio 43212.

p. 558
Dye-Craft
Change "from: Rit, etc."
to **from:**
Dye Craft
P.O. Box 307
Coventry, VT 06238

p. 559
Batik Suppliers – Inkodye
Change "Catalog $.25" to **Catalog free**

p. 560
The Joy of Spinning
Change $6.95 to **$7.95**

p. 561
Miller Loom Plans
Change $20.00 to **$30.00**

Building the Oregon Loom
Change "158pp." to **58pp.**

p. 562
New Sources – Yarns, Fibres, Dyes, Fleece
Straw Into Gold
Add P.O. Box 2904 to address

Bergit Ullman, Inc.
Change name to **Berga/Ullman, Inc.**

p. 569
Ikat: An Introduction
Change $2.25 to **$3.25**
Change "10pp." to **25pp.**

p. 570
Cut My Cote
Change $2.25 to **$2.00**

p. 574
The Vogue Sewing Book
Change 1973; 464pp. to **1975; 524pp.**

p. 577
Resources
Change "Resources, etc."
to Resources
Box 134
Harvard Square
Cambridge, MA 02144

Getting Together a People's Yellow Pages
Change $.50 to **$.60**

People's Yellow Pages (Boston Area)
Change $1.45 to **$1.50**

Chinook Centrex Portland Access Directory
Out of Print

The San Francisco and Bay Area People's Yellow Pages
Change $1.75 to **$2.25**

Gay Yellow Pages, the Quarterly Directory
Change to **Gayellow Pages, the Classified Directory**
Delete "(4 issues)"

p. 578
Living in the Ozarks Newsletter
Change "Joel Davidson, Ed." to **Joel and Sherri Davidson, Eds.**

Community Publications Cooperative
Communities and Openings available from CPC
Box 426-46
Louisa, VA 23093

Leaves of Twin Oaks and Twin Oaks Property Code
Available from:
Twin Oaks Community - Merion Branch
Rt. 4, Box 17, Dept. 2
Louisa, VA 23093

p. 579
Auroville
Change $2.25 to **$3.00**
Add **"heavily illustrated"**

p. 580
Ladies' Home Journal Art of Homemaking
Change $9.95 to **$12.95**

p. 584
Don't Go Buy Appearances
Change title to **Comstock Western Homebuyer's Guide**

p. 588
Diet for a Small Planet
Change $1.25 to **$1.50**
Delete **Friends of the Earth**

p. 592
Foods By Mail – Laurelbrook Foods
Add **(Retail stores and co-ops only.)**

Making Your Own Cheese and Yogurt
Change "Shipping and Service Center"
to Funk and Wagnalls
Conklin Book Center, Inc.
Baker Drive
Conklin, NY 13748

Successful Mass Cookery and Volume Feeding
Change $10.75 to **$12.35**

p. 594
Old Fashioned Recipe Book
Change $10.87 to **$12.95**

p. 595
Lowther Fruit Presses
Change $90.00 to **$99.00**
Change $65.00 to **$71.50**
Change Walcott, Vt. 05680 to **Wolcott, Vt. 05680**

p. 603
Pocket Horn
Change $3.25 to **$4.00**
Add **No. 41,423**

p. 608
The Joy of Sex
Change $4.95 to **$5.95**

p. 610
Mail Order Porn – Krow Enterprises
Add **Minimum order 2 films + $1.00 per order shipping**

Ritro Enterprises
Defunct

Quality Enterprises
Defunct

p. 612
Is My Baby All Right
Change $9.95 to **$12.95**

p. 618
Defend Yourself!
Change $1.25 to **$1.50**

p. 619
How to Get What the U.S. Government Owes Veterans and their Dependents
Temporarily Out of Print
Delete "or Whole Earth"

p. 622
Atlas of Africa
Delete "or Whole Earth"

p. 623
The Souls of Black Folks
Change $.75 to **$1.25**

Soledad Brother: The Prison Letters of George Jackson
Change $1.50 to **$1.95**

Selected Poems of Claude Mackay
Delete "or Whole Earth"

p. 624
Living Black American Authors, A Biographical Directory
Change "R.R. Bowker, etc."
to **R.R. Bowker**
Box 1807
Ann Arbor, MI 48106

JCPS News
Change "JCPS News" to **FOCUS**
Change "published periodically" to **published monthly**
Add **Available for $6 per copy. List of other publications available on request.**

African World
Change "Box 20826, etc."
to **P.O. Box 2413**
Washington, D.C. 20013
Change $3.75/yr to **$5.00/yr**

Home: Social Essays
Change $1.95 to **$2.95**

Black Bibliographies
Add price **$35.00**

Tricontinental News Service
Defunct

Race Relations Reporter
Defunct

p. 625
Journal of Negro Education
Change $5/yr to **$7.50/yr**
Change zip code 20001 to **20059**
Add **$12.50/2 yrs, $18.00/3 yrs**

The Review of Black Political Economy
Change $2.50 to **$3.50**
Change $10.00 to **$12.50**

p. 636
The People's Guide to Mexico
Change $3.95 to **$4.30**

Alaska
Pamphlet from Alaska Services is **Defunct**

p. 638
Richard's Bicycle Book
Change $1.95 to **$2.95**

p. 641
Kryptonite Bike Lock
Change "KBL Corporation, etc."
to **KBL Corporation**
95 Freeport St.
Dorchester, MA 02122

Rally Racks
Add **Starting at $16.90**

p. 642
How to Buy a Used Volkswagen in Europe, Keep it Alive, and Bring it Home
Change $3.25 to **$3.00**

p. 643
Superwinch
Change $49 to **$69.95**

Volkswagen Official Service Manuals
Change $9.95 to **$12.95 (2 x)**

p. 645
Windsurfer
Change $4.15 to **$4.50**

Hang Gliding - Hang Flight
Change 1974; 52pp. to **1974; 80pp.**

Hang Gliding
Change "49-194 Walker St., etc."
to **P.O. Box 4232-4**
Santa Barbara, CA 93103

p. 647
Pilot's Weather
Change $4.25 to **$9.95**

p. 648
Weems and Plath
Change "Davis Mark 3 ($17)" to **Davis Mark 3 ($18)**
Change Plath price $525 to **$575**
Change Star Finder price $13.50 to **$15.00**

Davis Instruments
Change Davis Mark 3 plastic sextant from $17 to **$17.95**
Change Navigation Kit from $39.95 to **$44.95**

Dive
Change "Shipping and Service Center"
to **Funk and Wagnalls**
Conklin Book Center, Inc.
Baker Drive
Conklin, NY 13748

p. 652
The Wonderful World of Houseboating
Change $9.95 to **$10.95**

p. 653
Whitewater Coaching Manual
Change "Jay Evans, etc."
to **Jay Evans Associates**
5 Sanborn Rd.
Hanover, NH 03755

p. 654
"Hipp"
Change "Hipp" to **Hyperform**
Change "High Performance Products, Inc." to **Hyperform**

The Stripper's Guide to Canoe Building 1972
Change "from Wilderness Boats, etc."
to **from:**
David Hazen
524 S.E. 15th #WE
Portland, OR 97214
Add address for
Wilderness Boats
Route 1, Box 101A
Carlton, OR 97111
Change $5.50 to **$6.95**

p. 655
Wilderness First Aid Kit Instructions
Change Stirling Wilderness Research Institute to **Sterling Wilderness Research Institute**

p. 658
Right-of-Way
Change $4.95 to **$5.95**

p. 659
How to Camp and Leave No Trace
Change "Gerry Division, Colorado Outdoor Sports Industries, etc."
to **Your local Gerry dealer**

p. 660
Synergy Works
Change "Information from, etc."
to **Catalog $1.00**
from:
Daniel Snurman
Synergy Works
6440 Valley View
Oakland, CA 94611
(415) 652-5462

Mountain Safety Research Newsletter and Catalog
Change $5.00 postpaid to **$10 (makes you a supporting member)**
Change "So. 96th St. at 8th Ave. So"
to **631 So. 96th St.**
Add **Current issue free to prospective subscribers. Selected articles reprint of last 8 issues – $1.75**

Off Belay
Change $6/yr to **$7.50/yr**

Forrest Mountaineering
Catalog – add price **$1.75**
Change "Forrest Mountaineering, etc."
to **Forrest Mountaineering**
1517 Platte Street
Denver, CO 80202
Pinbin-Bandolier, change $6.95 to **$7.50**

p. 663
Tubbs Snowshoes
Change "18 Elm St., Wallingford, VT 05773" to **Forestdale, VT 05745**

Mountain Gazette
Change $5.00/1 yr to **$6.00/1 yr**
Change address
to **2025 York Street**
Denver, CO 80205

XC Cross-Country Skiing
Change "XC, Tobey Pub. Co., etc."
to **Dell Publishing Co., Inc.**
1 Dag Hammarskjold Plaza
245 East 47th Street
New York, NY 10017

p. 665
Log Cabin Sport Shop Catalog
Change $1.50 to **$2.00**

Airgun Source Book/Catalog
Change $1.50 to **$1.00 3rd class, $2.50 air mail**

Air Rifle Headquarters Catalog
Change $1.00 to **Free**

p. 666
Knife Digest
Add **Published annually**

Knives and Knifemakers
Change $4.95 to **$6.95**

p. 669
Volkswagen Official Service Manual
Change $9.95 to **$12.95**

p. 672
Mail Scale
Change address
to **AAA Scale Co.**
P.O. Box 496
Paramount, CA 90723

Dvorak Simplified Typing-Synergistic Typing
Change $12.00 to **$14.95**
Change "Motivational Communications Corp."
to **Dr. August Dvorak**
7028 - 55th Ave., N.E.
Seattle, WA 98115
Add: **DSK Selectric Elements available from**
Camwil, Inc.
835 Keeaumoko St.
Honolulu, HI
Add price **$60-70**

p. 673
Phone-Mate – Remote-Mate
Change from $269.00 to **$239.90**

p. 679
The Design of Books
Change 1967; 160pp to **1974; 160pp.**
Change $4.95 to **$6.95**

Editing By Design
Change "R.R. Bowker Co., etc."
to **R.R. Bowker Co.**
Box 1807
Ann Arbor, MI 48106

p. 680
Words Into Type
Change $12.50 to **$12.95**

p. 682
Library Journal
Change "Library Journal, etc."
to **Library Journal**
R.R. Bowker Co.
Subscription Service Dept.
P.O. Box 67
Whitinsville, MA 01588

p. 685
Whole Cosmep Catalog
Change $4.95 to **Out of Print til January 1976**

Small Press Review
Change "5218 Scottwood Road"
to **Box EE**

p. 686
Access to Poetry – Whole Cosmep Catalog
Out of Print til January 1976
Change "St. Marks Poetry Project, etc."
to **The Poetry Project**
St. Marks Church In-the-Bowery
10th St. and 2nd Avenue
New York, NY 10003

p. 688
Mandala
Out of Print

p. 689
A.I. Friedman Art Supplies
Catalog free – Add **(late '75 or early '76)**

History of Underground Comics
Change $9.95 to **$10.70**
Change "Straight Arrow Books, etc."
to **Straight Arrow Books**
625 Third Street
San Francisco, CA 94107

p. 692
Independent Filmmaking
Change $5.95 to **$8.70**
Change "Straight Arrow, etc."
to **Straight Arrow**
625 Third Street
San Francisco, CA 94107

p. 694
Independent Video
Change $7.95 to **$8.70**
Change "Straight Arrow, etc."
to **Straight Arrow**
625 Third Street
San Francisco, CA 94107

Community Video Report
Change "Community Video Report"
to **tele-VISIONS**
Change "$4/yr, personal, $12/yr industry" to **$10/10 issues**
Delete **Quarterly**

Radical Software
Change Vol. II (1-6) to **Vol. II (1-5)**
Add **Vol. II (#6) $2.95 each**

p. 695
Video Hardware Dealer
Defunct

Avalanche
Change $8.50/yr to **$10.00/yr**

The Prime Time Survey
Change "TVTV, etc."
to **TVTV**
Box 48-455
Los Angeles, CA 90048

Filmmakers Newsletter
Change $7/yr to $8/yr

p. 696
More About This Business of Music
Change $6.95 to **$10.95**
Change "1967; 160pp." to **1974; 204pp.**

p. 698
Dynaco 4 Dimensional Sound System
Change "Dynaco" etc.
to **Dynaco**
Box 88/Coles Rd.
Blackwood, NJ 08012

Mugwumps
Change $5/yr to $6/yr
Change "MIH, etc."
to **MIH**
12704 T Barbara Rd.
Silver Springs, MD 20906

p. 699
Timekeeper
Model P-200 Change $119.50 to **$139.50**
Standard model ($59.95) no longer available.
Change "P.O. Box 835" to **P.O. Box 35**

Speakerlab
Catalog – change "Speakerlab, etc."
to **Speakerlab - Dept. WEE**
5500 - 35th N.E.
Seattle, WA 98105

The Rolling Stone Guide to High Fidelity Sound
Change $4.95 to **$5.70**
Change "Straight Arrow, etc."
to **Straight Arrow**
625 Third Street
San Francisco, CA 94107

The Absolute Sound
Change $8/yr to **$10/yr**
Change "The Absolute Sound, etc."
to **The Absolute Sound**
Box 5
Northport, NY 11768

p. 701
Electronic Music Studios
Defunct

PAIA 2720
Change $139.00 to **$149.00**
Change zip code 93114 to **73114**

ARP Instruments
Arp 2600 – Change $3000 to **$3095**
Soloist - Defunct

p. 703
World Radio and TV Handbook 1974
Change $7.50 to **$8.95**

Shortwave Listener's Handbook
Change $3.95 to **$4.90**

p. 705
Principles of Systems
Change $8.00 to **$10.00**

Fundamental Algorithms
Change $19.50 to **$19.95**

Design of Man-Computer Dialogues
Change $15.95 to **$19.00**

p. 706
Heliwire Connectors
Change Rothley, Leics. LE7 &SE to **Rothley, Leicester LE7 7SE**

Natural Structure
Add **$7.50 outside Continental U.S.A.**

p. 707
Game Theory
Change $2.95 to **$3.50**

p. 708
Journey Among the Economists
Delete "Library Press, Inc."

p. 709
Handbook for Manufacturing Entrepreneurs
Change "Western Reserve Press, Inc."
to **Western Reserve Press, Inc.**
P.O. Box 675
Ashtabula, OH 44004
or **Van Nostrand Reinhold**
Order Dept.
300 Pike St.
Cincinnati, OH 45202

p. 711
Parent Effectiveness Training
Change "Kristin Klawson" to **Kristin Lawson**

How to Father
Change $8.95 to **$1.95**
Change "Nash Publishing Corp., etc."
to **New American Library**
1301 Avenue of the Americas
New York, NY 10003

p. 712
The Best in Children's Books
Change $9.95 to **$12.50**

Paddle-to-the Sea
Change $4.20 to **$6.95**

Seabird
Change $4.07 to **$6.95**

Tree in the Trail
Change $4.95 to **$6.95**

p. 713
At The Pond
Vol. I: Corvus the Crow – Change $5.50 to **$5.95**
Vol. II: Lotor the Raccoon – Change $5.50 to **$5.95**

p. 715
Nantucket Kiteman
Change "They run from $6.50 to about $30.00 . . ." to **They run from $7.00 to $35.00**

Pollock's Toy Theatres
Change "1, La Scala St.," to **1 Scala St.**
Change "Prices range from 82p . . ." to **Prices range from £1.15**

p. 717
Early American Crafts and Hobbies
Change "Shipping Service Center"
to **Funk and Wagnalls**
Conklin Book Center, Inc.
Baker Drive
Conklin, NY 13748

p. 721
Will It Grow In a Classroom?
Change $2.95 to **$3.25**

p. 722
Source Book of African & Afro-American Materials for Music Education
Change "MENC Publication Sales, etc."
to **MENC Publication Sales**
8150 Leesburg Pike
Suite 601
Vienna, VA 22180

p. 724
Games & Puzzles
Change $9.00 to **$10.80**
Change $16.50 to **$20.00**
Change "from Circulation Manager, etc."
to **Dept. 3**
Games & Puzzles II
Tottenham Court Road
London W1A 4XF, England

Simulation/Gaming/News
Change "$4.00/yr. (five issues)" to **$6.00/yr. (six issues)**

The Guide to Simulations/Games for Education and Training
Change $15.00 to **$25.00**
Change "Information Resources, etc."
to **Research Media, Inc.**
4 Midland Avenue
Hicksville, NY 11801

p. 725
Media Mix
Change $5/yr to **$7/yr (eight issues)**

Films Kids Like
Change $4.95 to **$5.50**

p. 727
Only a Little Planet
Change $4.95 to **$6.95**
Delete "Friends of the Earth"

The Frail Ocean
Delete Sierra Club

p. 728
The Complete Out-of-Doors Job, Business, and Profession Guide
Change "Henry Regnery Co., etc."
to **Henry Regnery Co.**
180 N. Michigan Ave.
Chicago, IL 60601

p. 730
Clouds
Change $.25 to **$.35**

p. 732
New Colleges for New Students
Change $8.75 to **$8.95**

Independent Study Program
Change International Community College, etc."
to **International Community College**
1019 Gayley Ave.
Suite 105
Westwood Village
Los Angeles, CA 90024

p. 733
Changes
Change $6.50/yr. to **$8.50/yr.**

p. 734
Human Behavior
Out of Print

p. 738
Pharm Chem
Change "Pharm Chem Laboratories" to **Pharm Chem Research Foundation**
Change "1848 Bay Road" to **1844 Bay Road**
Pharm Chem Newsletter – Change "free" to **$20/yr. agencies, $10/yr. individuals**

Grassroots
Change $95. to **$115.**

p. 739
Field Guide to the Psilocybin Mushroom
Change "P.O. Box 15667, etc."
to **P.O. Box 2673**
Chapel Hill, NC 27514

p. 740
Uniquity
Change "Uniquity, etc."
to **Uniquity**
13344 Beach Ave.
P.O. Box 990
Venice, CA 90291

Madness Network News
Change address "Box 684, etc."
to **2150 Market Street**
San Francisco, CA 94114

p. 741
Advanced Techniques of Hypnosis & Therapy
Change $19.75 to **$21.00**

p. 742
Biofeedback Gear
Change "Bio-Feedback Technology, Inc." etc.
to **Bio-Feedback Technology, Inc.**
10592 Trask Avenue
Garden Grove, CA 92643

Aquarius Electronics
Change "P.O. Box 627, etc."
to **Box 96 WE**
Albion, CA 95410

p. 743
Sensory Deprivation Tank Kit
Change $900 FOB Mar Vista, CA"
to **$900 FOB Los Angeles, CA 90039**
Change from "Samadhi Tank Co., etc."
to **Samadhi Tank Co.**
2123 Lake Shore Avenue
Los Angeles, CA 90039

p. 744
The East-West Journal
Change Robert Hargrove, Ed. to **Sherman Goldman, Ed.**
Change $5.00 to **$9.00/12 issues USA**
Change $7.00 to **$11.00/12 issues outside of USA**

p. 745
Meditation Cushions
Change "Samadhi, etc."
to **Samadhi Cushions**
c/o Karme-Choling
Star Route
Barnet, VT 05821

Return to the Source
Change $2.95 to **$1.50**

Grassroots Distribution

If you know of several bookstores or newsstands in your area that would be interested in carrying **The CoEvolution Quarterly**, *you might want to become one of our distributors.*

We'll ship you the current issue of **The CQ** *in case-lots of 75 copies per case for $1.00 per copy, postpaid. (Please send full payment with your order.) The suggested price to retailers is $1.20 per copy. We'll give full credit for unsold copies which are returned to us.*

Several other "alternative" periodicals, most notably **Mother Earth News**, **East-West Journal**, *and* **The New Journal**, *have been experimenting with having their readers become distributors. Our ultimate vision is to participate in a national grassroots distribution network which could reach shops not being served by the current distribution networks. If you're interested, contact us at Box 428, Sausalito, CA 94965. Phone (415) 332-1716.*

– Andrew Fluegelman
Pam Cokeley

Who we read

The other major information source for us beside reader contributions and our own experience is magazines, newspapers, newsletters, and occasionally catalogs.

Here are the ones we subscribe to, faithfully scan, and feel burdened by when we fall behind.

They are listed in order, NOT of their quality, but of their yield in tips and reprintables for The CoEvolution Quarterly. *— SB*

Publishers Weekly
$25/yr. (weekly)
Box 67
Whitinsville, MA 01588

Library Journal
$16.20/yr. (bi-weekly)
R.R. Bowker Co.
Box 67
Whitinsville, MA 01588

Science
$40/yr. (weekly)
AAAS
1515 Massachusetts Ave., N.W.
Washington, DC 20005

New Scientist
$37.50/yr. (weekly)
New Science Publications
128 Long Acre
London WC2E 9QH
England

A.D.
$34/yr. (monthly)
26 Bloomsbury Way
London WC1A 2SS
England

Popular Science
$6.94/yr. (monthly)
Popular Science Subscription Dept.
Boulder, CO 80302

Organic Gardening & Farming
$6.85/yr. (monthly)
33 East Minor St.
Emmaus, PA 18049

Alternative Sources of Energy
$5/yr. (6 bi-monthly issues)
ASE
Rt. 2, Box 90A
Milaca, MN 56353

Mother Earth News
$10/yr. (6 issues)
P.O. Box 70
Hendersonville, NC 28739

Not Man Apart
$10/yr. (semi-monthly)
Friends of the Earth
529 Commercial
San Francisco, CA 94111

Appropriate Technology
$8.50/yr. (quarterly)
Intermediate Technology Publications Ltd.
9 King St. (Covent Garden)
London WC2
England

Manas
$5/yr. (weekly)
Manas Publishing Co.
Box 32112
El Sereno Station
Los Angeles, CA 90032

Rain
free (monthly)
Environmental Education Center
Portland State University
P.O. Box 751
Portland, OR 97207

Solar Energy Digest
$27.50/yr. (monthly)
Box 17776
San Diego, CA 92117

Scientific American
$12/yr. (monthly)
P.O. Box 5919
New York, NY 10017

East West Journal
$9/yr. (monthly)
31 Farnsworth St.
Boston, MA 02210

Technology Review
$12/yr. (8 issues)
Room E19-430
MIT
Cambridge, MA 02139

New Age Journal
$6/yr. (bi-monthly)
145 Portland Street
Cambridge, MA 02139

The Futurist
$12/yr. (bi-monthly)
World Future Society
P.O. Box 30369
Bethesda Branch
Washington, DC 20014

Wall Street Journal
$42/yr. (daily)
200 Burnett Rd.
Chicopee, MA 01021

Acres, U.S.A.
$5.50/yr. (monthly)
Acres U.S.A.
10227 East 61st St.
Raytown, MO 64133

Audubon
$13/yr. (bi-monthly)
Membership Dept.
950 Third Avenue
New York, NY 10022

The Monthly Extract
$3.50/yr. (six issues)
New Moon Communications, Inc.
Box 3488, Ridgeway Station
Stamford, CT 06905

Machine Design
$25/yr. (31 copies)
Penton Plaza
Cleveland, OH 44114

The Ecologist
$12/yr. (monthly)
73 Molesworth St., Wadebridge
Cornwall PL27 7DS
England

Oil & Gas Journal
$52/yr. (weekly)
Box 1260
Tulsa, OK 74101

Undercurrents
$5/yr. (bi-monthly)
275 Finchley Rd.
London NW3
England

Pacific Sun
$12/yr. (weekly)
21 Corte Madera Ave.
Box 553
Mill Valley, CA 94941

The S.F. Bay Guardian
$7/yr. (fortnightly)
1070 Bryant Street
San Francisco, CA 94103

Rolling Stone
$14/yr. (bi-monthly)
Box 2983
Boulder, CO 80302

Shuttle Spindle & Dyepot
$9/yr. (quarterly)
998 Farmington Ave.
West Hartford, CT 06107

Moneysworth
$5/yr. (bi-weekly)
Moneysworth
251 W. 57th Street
New York, NY 10019

Natural History Magazine
$10/yr. (ten issues)
The American Museum of Natural History
79th Street & Central Park West
New York, NY 10024

Popular Electronics
$7.98/yr. (monthly)
P.O. Box 2774
Boulder, CO 80302

Horizon
$26/yr. (quarterly)
379 West Center St.
Marion, OH 43302

The Washington Spectator
(formerly Washington Watch)
$10/yr. (24 issues)
P.O. Box 1750
Annapolis, MD 21404

Science News
$10/yr. (weekly)
Sub. Dept.
231 W. Center St.
Marion, OH 43302

Resurgence
$7/yr. (bi-monthly)
275 Kings Road
Kingston, Surrey
England

Madness Network News
$9/yr.
2150 Market Street
San Francisco, CA 94114

Small Press Review
$6/yr. (monthly)
Box EE
Paradise, CA 95969

The Poetry Project Newsletter
free (monthly)
St. Mark's Church
10th Street & 2nd Avenue
New York, NY 10003

Bookletter
$15/yr. (bi-weekly)
Harpers Magazine Co.
2 Park Avenue
New York, NY 10016

Harper's Weekly
$12/yr. (weekly)
2 Park Avenue
New York, NY 10016

Esquire
$9/yr. (monthly)
Esquire, Inc.
65 E. South Water St.
Chicago, IL 60601

tele-VISIONS
(formerly Community Video Report)
$10/10 issues
Box 21068
Washington, DC 20009

Win
$11/yr. (weekly)
Box 547
Rifton, NY 12471

Akwesasne Notes
no fixed price, donate generously
(7 issues a year)
Mohawk Nation
Via Rooseveltown, NY 13683

The Black Panther Intercommunal News Service
$10/yr. (weekly)
Central Distribution
8501 E. 14th Street
Oakland, CA 94621

Science in the Neighborhood
free (monthly)
Community Technology, Inc.
1520 New Hampshire Ave., N.W.
Washington, DC 20036

Evolutionary Theory
$10/yr.
Biology Dept.
1103 E. 57th St.
University of Chicago
Chicago, IL 60637

The CoEVOLUTION Quarterly

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Craft evaluations Diana Sloat
Community evaluations J.D. Smith
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(cover) Hatcher Trade Press, San Carlos, California

CoEvolution Quarterly Costs — Spring '75

Staff Salaries	$11,850
Contributors	4,100
Office (rent, util., supplies)	1,500
Production Supplies	1,300
Phone	900
Postage, shipping & subscriptions	900
Research (book purchases)	200
Printing (17,000 copies)	8,930
TOTAL	$29,680

If you've been tracking these per issue reports, you've noticed that our expenses have risen again since the last issue. Not many things are getting cheaper these days.

Based on printing 15,000 copies, the unit cost of this CQ is $1.75. In return, we'll receive $1.50 for each copy sent to subscribers and about $1.00 for each copy sold for bookstore and newsstand distribution.

We're still committed to keeping the cover price at $2.00. To do that and break even, we figure we'll need about 20,000 subscribers. New subscriptions (and renewals) are welcome. Meanwhile the EPILOG keeps us in business.

— Andrew Fluegelman

Gossip

We expected to leave distribution of the WHOLE EARTH CATALOG in the hands of Random House no matter how good a job Penguin might do distributing the WHOLE EARTH EPILOG. Loyalty and everything.

A lot of business gets transacted with a distributor, especially when they supervise manufacture of the book. Schedules, text corrections, accounting, price notification, press runs, quality control, payments, announcements, coordination. For a year we experienced the growing (sinking) feeling that nearly everything Random House touched came back late, short, or wrong.

It wasn't always that way. Perhaps they felt betrayed by the EPILOG going to Penguin, or our special case became a nuisance not worth the trouble, or Random has elephantiasis problems. Whatever, one day in December Andrew Fluegelman, Don Gerrard, and I simultaneously realized that our teeth were ground right through. We wanted out.

We checked with Penguin, who had done a nearly perfect job with the EPILOG and at a better price, to see if they would take on the CATALOG. They said fine. So notification duly went to Random House to terminate our contract, on the six-months-notice clause.

This June 1975, therefore, the 16th printing of The Updated LAST WHOLE EARTH CATALOG will arrive on the market through Penguin Books. We're doing the corrections this time — Andrew Main is making new flats (positive pages) from the negatives — so a lot of the confusion in the book should be reduced and access information brought all the way up to date. There will be a spell around April and May when no CATALOGs are available — to clear everyone's accounts — and then the NEW! IMPROVED! new improved.

Someone asked me at a talk why we didn't reduce the price as we sold more books (1,430,000 CATALOGS at present). I explained that inflation and paper costs were doing it for us. We'll hold the CATALOG $5 line and EPILOG $4 line as long as possible.

Local gossip. Andrew Fluegelman, in his spare time, has co-founded a San Francisco publishing house called The Headlands Press. First book will be San Francisco Free & Easy, *by the* Bay Guardian.

Two new faces on this CQ production are typesetter Joy Byars and illustrator Carol Kramer — one each Texan and Oklahoman, both 27 (like Diana Fairbanks, Andrea Sharp, Rosie Menninger. The class of '69.)

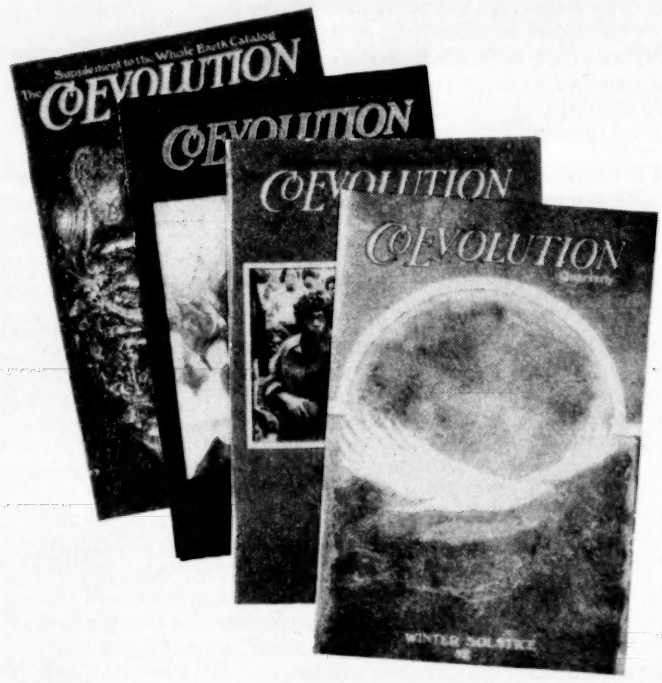
Rosie says I should cop to the fact that we've got some kind of organism going here, which has its own ideas and own luck. People show up on perfect cue, unsummoned. A certain flow carries us better than we can drive. I say, yeah, but it's best not to talk about good luck, or encourage in-groupiness. Thanks are always due. This has been the most relaxed production yet.

— SB

Carol Kramer and Joy Byars

Back issues

Summer '74, Fall '74 (Black Panther issue), Winter '74, and this one – Spring '75 – back issues of **The CQ** are available postpaid from us. (Spring '74 is sold out.) 1 copy: $2. 3 copies: $5. 4 copies: $6. More: $1 each. From Box 428, Sausalito, CA 94965.



A Plea to Subscribers

Since our readers tend to be nomadic, we've been receiving a large number of notices from the Post Office of **CQ**'s that were not delivered because the subscriber moved (and didn't guarantee postage for 2nd class mail). In an effort to stay in touch with all our subscribers, we've been tracking down their new addresses, changing them on our records, and sending a copy of the missed issue to the new address. To do that, it costs us: $.10 postage due for notice of the undelivered mail, $.20 postage to mail a single copy of the **CQ**, $1.30 for the cost of the copy itself, plus the costs in dollars and energy to process all that.

If you're planning on moving, you can help us greatly if you'll let us know in advance, so we can get the next issue of the **CQ** to you promptly and efficiently. The best way to let us know your new address is to send us an address label from an old **CQ**, plus your new address (with zip code).

—Andrew Fluegelman

Subscribing to **The CQ** *saves both you and us 50¢ per copy.*

to: **The CQ**
558 Santa Cruz
Menlo Park, CA 94025

Please send me the next four issues of **The CoEvolution Quarterly.** Enclosed is my check for $6.

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Means that you can mailorder the item from either the supplier shown, or from:

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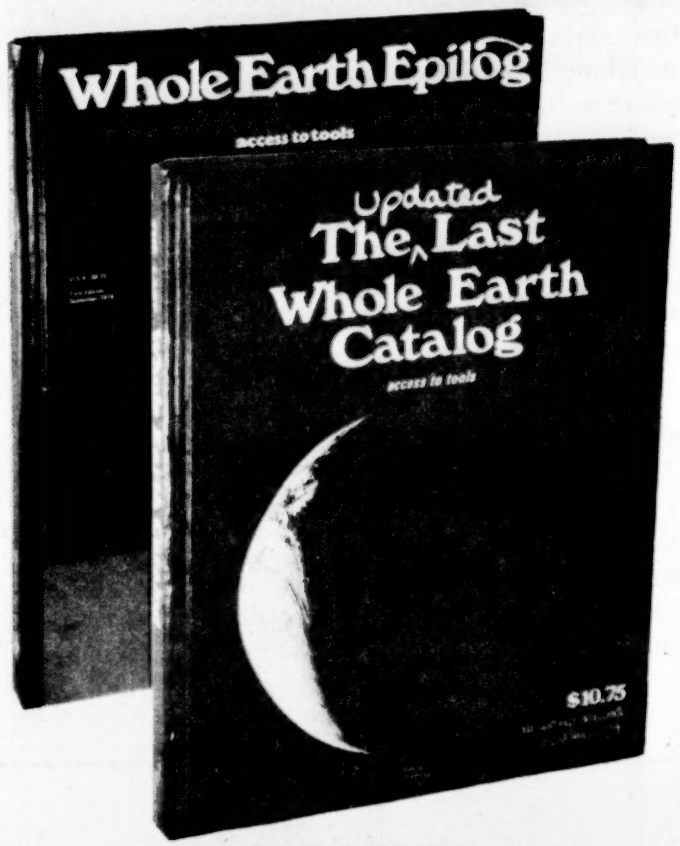

Hardcover Epilogs and Catalogs

Just off the press are 20,000 hardcover **Whole Earth Epilogs** and 4400 hardcover **Last Whole Earth Catalogs.** We had them made for libraries, schools, and others with many persons-per-book. The result is finer than we expected – beautiful WHITE pages. Solid reference.

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Freedom

YOU CAN DO ANYTHING THAT YOU REALLY WANT TO DO, BUT NOT EVERYTHING. Nobody ever told me the part after the comma, the limit. It's tough to accept after all these years, but I smell freedom beyond the adjustment.

– Rick Wannall
Freeport, Texas

"Hello CQ, CQ, CQ. This is W9HOA calling CQ. Over."

Arthur (Bob) Brand

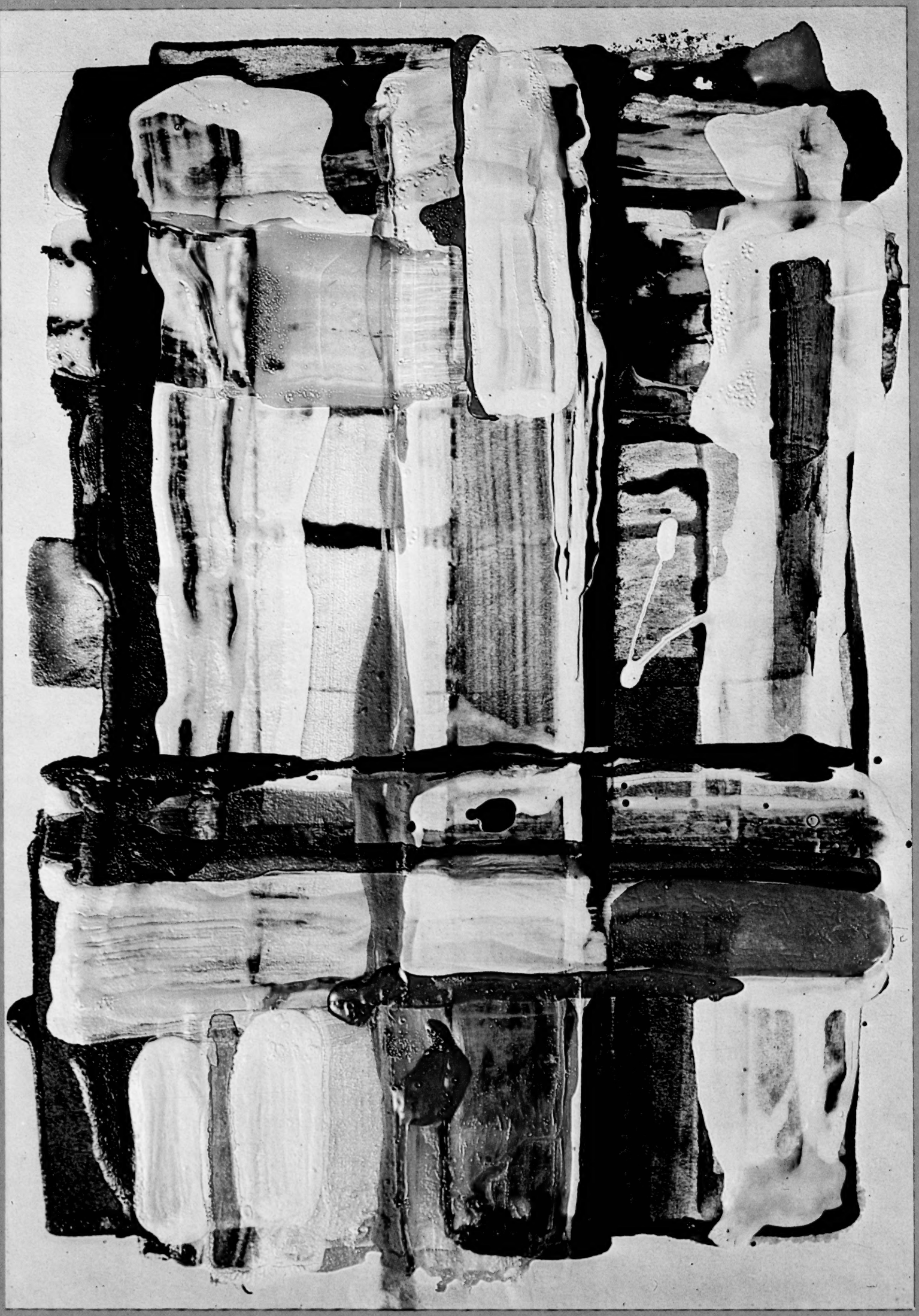
My father was a ham, an amateur radio operator. From his hamshack in the basement, walled with World War II radio equipment, he would chant the above litany over and over until some other ham would reply from Australia, Europe, Japan, South America, Texas. They would discuss their weather and equipment and then resume the search for other strangers.

"CQ" is a conventional invitation to talk — one of a number of Morse Code abbreviations. It means, of course, "seek you."

("W9HOA" was my dad's call letters, his radio identity. Using the then-current phonetic alphabet the chant would vary: "This is W9HOA. This is W9 How-Oboe-Able." When he was feeling fey, "W9 Hell's-Only-Angel," "W9 Holy-Old-Armpits.")

Hello CQ. We invite your participation in **The CoEvolution Quarterly** *— by sending in suggestions, reviews, comments, articles and pictures, of your own or other people's, original or for reprint. We pay minimum $10, maximum $200, depending on size and cogency. Over.*

The CQ
Box 428
Sausalito, CA 94965



"I have done a couple of paintings with the theme of CoEvolution embedded in my eye; the Grand Weave, the impossible space, the inevitable sharing of every color and form."

–Dean Fleming